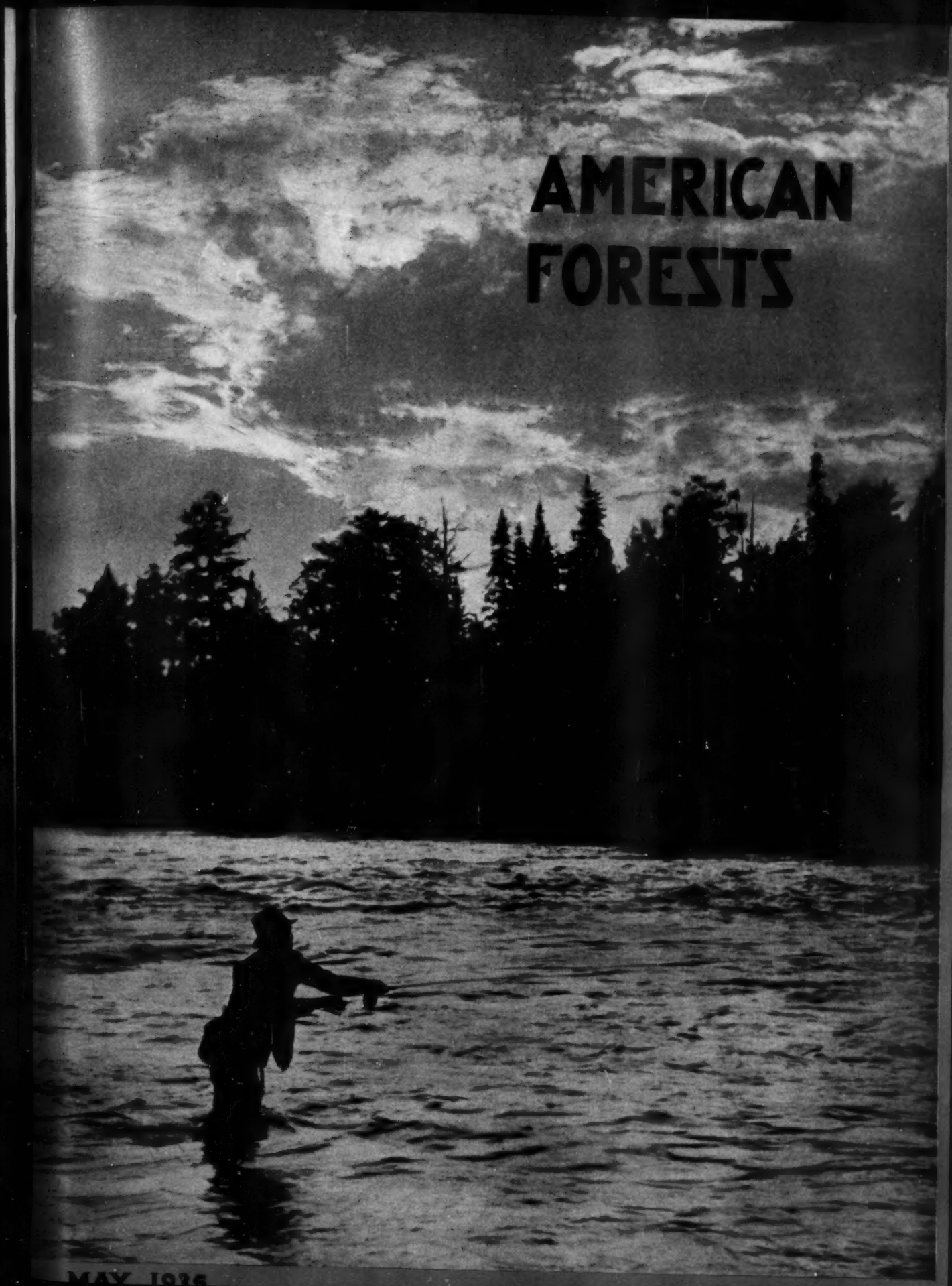
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CONTENTS FOR MAY, 1935

Vol. 41 ◆ ◆ ◆ No. 5

THE COVER—"The Dawn Cast"
Photograph by ROBERT DUDLEY SMITH

"THE SMOKE TREE"
Photograph by ERNEST WILLIAMS—Winner of Second National Award in 1934 National Competition for Beautiful Photographs of Trees in America 204

COON VALLEY
By ALDO LEOPOLD 205

WOOD'S CASE AGAINST HAUPTMANN 209

NATURE'S THREE FINGERED VILLAIN
By G. ALBERT HILL 212

LOOKING AHEAD WITH THE C.C.C.
By AUSTIN F. HAWES 214

ANNOUNCING 1935 ANNUAL MEETING 214

REMOVING THE "DEATH" FROM DEATH VALLEY
By T. R. GOODWIN 215

EDITORIAL
Forest Credits Needed Now! 219

LIGHTNING PROTECTION FOR TREES
By H. STEVENSON CLOPPER 220

TREE FLOWERS WITH THE MINIATURE CAMERA
By WILLIAM M. HARLOW 222

WHITE BIRCH—A MOTHER'S DAY POEM
By NELL E. MABEY 224

WILDERNESS TRAILS FOR 1935 225

FOREST SCHOLARS
By CHARLES NEWTON ELLIOTT 226

FIELD AND FOREST FOR BOYS AND GIRLS
The God of Nature
By JOHN HARVEY FURBAY 228

TREES AND THEIR USES
No. 5—The Red Fir
Drawn by CALVIN FADER 229

RED FIR (Tree Series) 230

AROUND THE STATES 232

PRESIDENT ROOSEVELT ORDERS EXPANSION OF THE CIVILIAN CONSERVATION CORPS 232

THE WHITE BIRCHES
Poem by M. W. ATKINSON 241

ASK THE FORESTER 246

BOOK REVIEWS 247

AMONG THE CURRENT PUBLICATIONS 247

THE CONSERVATION CALENDAR IN CONGRESS 248

FORESTRY IN CONGRESS
By G. H. COLLINGWOOD 250

SAPLING SAM'S COLUMN 252

MAGNOLIA TREE
Poem by ROBERT SPARKS WALKER 253

"WHO'S WHO" AMONG OUR AUTHORS 256

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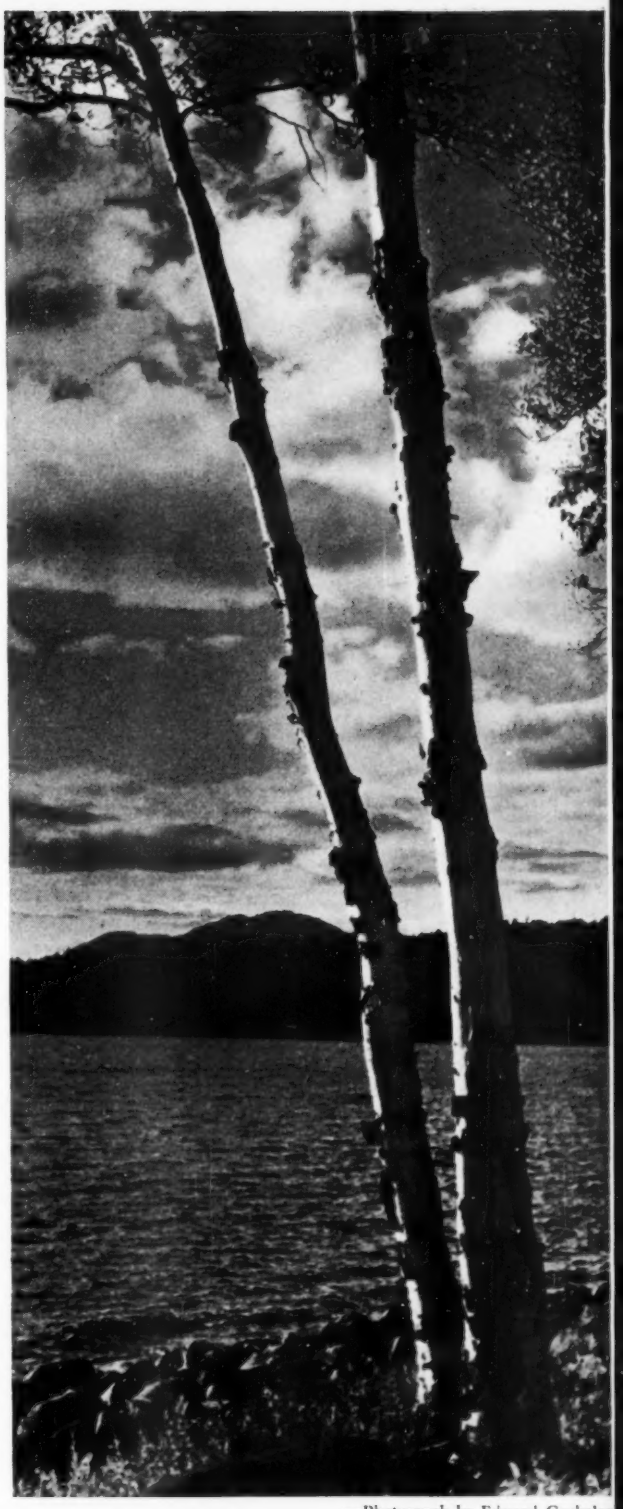

—Photograph by Edward Gockeler

"A spirit of beauty walks the hills,
A spirit of love the plain,
The shadows are bright, and the sunshine fills
The air with a diamond rain!

"Is a white dove glancing across the blue,
Or an opal taking wing?
For my soul is dazzled through and through,
With the splendor of the Spring."

—Bayard Taylor

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AMERICAN FORESTS

Vol. 41 MAY, 1935 No. 5

COON VALLEY

AN ADVENTURE IN COOPERATIVE CONSERVATION

By ALDO LEOPOLD

(Photographs by courtesy of the Soil Erosion Service)

THERE are two ways to apply conservation to land. One is to superimpose some particular practice upon the pre-existing system of land-use, without regard to how it fits or what it does to or for other interests involved.

The other is to reorganize and gear up the farming, forestry, game cropping, erosion control, scenery, or whatever values may be involved so that they collectively comprise a harmonious balanced system of land-use.

Each of our conservation factions has heretofore been so glad to get any action at all on its own special interest that it has been anything but solicitous about what happened to the others. This kind of progress is probably better than none, but it savors too much of the planless exploitation it is intended to supersede.

Coon Valley is one of the thousand farm communities which, through the abuse of its originally rich soil, has created the Mississippi flood problem, the navigation problem, the overproduction problem, and the problem of its own future continuity.

Lack of mutual cooperation among conservation groups is reflected in laws and appropriations. Whoever gets there first writes the legislative ticket to his own particular destination. We have somehow forgotten that all this unorganized avalanche of laws and dollars must be put in order before it can permanently benefit the land, and that this onerous job, which is evidently too difficult for legislators and propagandists, is being wished upon the farmer and upon the administrator of public properties. The farmer is still trying to make out what it is that the many-voiced public wants him to do. The administrator, who is seldom trained in more than one of the dozen special fields of skill comprising conservation, is growing gray trying to shoulder his new and incredibly varied burdens. The stage, in short, is all set for somebody to show that each of the various public interests in land is better off when all cooperate than when all compete with each other. This principle of integration of land uses has been already carried out to some extent on public properties like the National Forests. But only a fraction of the land, and the poorest fraction at that, is or can ever become public property. The crux of the land problem is to show that integrated use is possible on private farms, and that such integration is mutually advantageous to both the owner and the public.

Such was the intellectual scenery when in 1933 there appeared upon the stage of public affairs a new federal bureau, the United States Soil Erosion Service. Erosion-control is one of those new professions whose personnel has been recruited by the fortuitous interplay of events. Previous to 1933 its work had been to define and propagate an idea,

One of innumerable little units of the Mississippi basin, Coon Valley helps to fill the national dinner pail. Its particular contribution is butterfat, tobacco, and scenery.

rather than to execute a task. Public responsibility had never laid its crushing weight on their collective shoulders. Hence the sudden creation of a bureau, with large sums of easy money at its disposal, presented the probability that some one group would prescribe its particular control technique as the panacea for all the ills of the soil. There was, for example, a group that would save land by building concrete check-dams in gullies, another by terracing fields, another by planting alfalfa or clover, another by planting slopes in alternating strips following the contour, another by curbing cows and sheep, another by planting trees.

It is to the lasting credit of the new bureau that it immediately decided to use not one, but all, of these remedial methods. It also perceived from the outset that sound soil conservation implied not merely erosion control, but also the integration of all land crops. Hence, after selecting certain demonstration areas on which to concentrate its work, it offered to each farmer on each area the cooperation of the government in installing on his farm a reorganized system of land-use, in which not only soil conservation and agriculture, but also forestry, game, fish, fur, flood-control, scenery, songbirds, or any other pertinent interest were to be duly integrated. It will probably take another decade before the public appreciates either the novelty of such an attitude by a bureau, or the courage needed to undertake so complex and difficult a task.

The first demonstration area to get under way was the Coon Valley watershed, near LaCrosse, in west-central Wisconsin. This paper attempts a thumbnail sketch of what is being done on the Coon Valley Erosion Project. Coon Valley is one of the innumerable little units of the Mississippi Valley which collectively fill the national dinner pail. Its particular contribution is butterfat, tobacco, and scenery.

When the cows which make the butter were first turned out upon the hills which comprise the scenery, everything was all right because there were more hills than cows, and because the soil still retained the humus which the wilderness vegetation through the centuries had built up. The trout streams ran clear, deep, narrow, and full. They seldom overflowed. This is proven by the fact that the first settlers stacked their hay on the creekbanks, a procedure now quite unthinkable. The deep loam of even the steepest fields and pastures showed never a gully, being able to take on any rain as it came, and turn it either upward into crops, or downward into perennial springs. It was a land to please everyone, be he an empire-builder or a poet.

But pastoral poems had no place in the competitive industrialization of pre-war America, least of all in Coon Valley with its thrifty and ambitious Norse farmers. More cows, more silos to feed them, then machines to milk them, and then more pasture to graze them—this is the epic cycle which tells in one sentence the history of the modern Wisconsin dairy farm. More pasture was obtainable only on the steep upper slopes, which were timber to begin with, and should have remained so. But pasture they now are, and gone is the humus of the old prairie which until recently enabled the upland ridges to take on the rains as they came.

Result: Every rain pours off the ridges as from a roof. The ravines of the grazed slopes are the gutters. In their pastured condition they cannot resist the abrasion of the silt-laden torrents. Great gashing gullies are torn out of the hillside. Each gully dumps its load of hillside rocks upon the fields of the creek bottom, and its muddy waters into the already swollen streams. Coon Valley, in short, is one of the thousand farm communities which, through the abuse

Gone is the humus of the old prairie which until recently enabled the upland ridges to absorb the rains as they came. Now rain runs off deforested ridges as from a roof. The ravines are the gutters and great gashing gullies are torn out of the hillside.

of its originally rich soil, has not only filled the national dinner pail, but has created the Mississippi flood problem, the navigation problem, the overproduction problem, and the problem of its own future continuity.

The Coon Valley Erosion Project is an attempt to combat these national evils at their source. The "nine-foot channel" and endless building of dykes, levees, dams and harbors on the lower river, are attempts to put a halter on the same bull after he has gone wild.

The Soil Erosion Service says to each individual farmer in Coon Valley: "The government wants to prove that your farm can be brought back. We will furnish you free labor, wire, seed, lime, and planting stock, if you will help us reorganize your cropping system. You are to give the new system a 5-year trial." A total of 315 farmers, or nearly half of all the farms in the watershed, have already formally accepted the offer. Hence we now see foregathered at Coon Valley a staff of technicians to figure out what should be done; a C.C.C. camp to perform labor; a nursery, a seed warehouse, a lime quarry, and other needed equipments; a series of contracts with farmers, which, collectively, comprise a "regional plan" for the stabilization of the watershed and of the agricultural community which it supports.

The ravines of the grazed slopes as shown in this close-up view are dumping with very heavy rain loads of hillside rocks upon the fields of the creek bottom, and muddy waters into already swollen streams below.

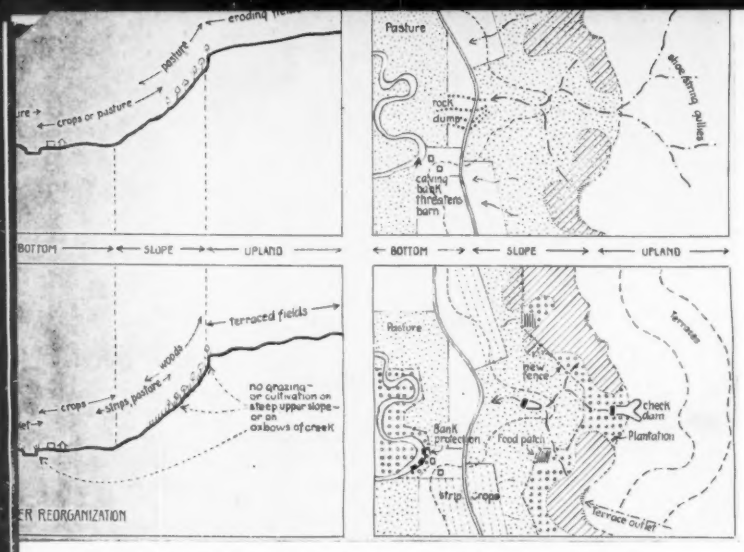
The plan, in a nutshell, proposes to remove all cows and crops from steep slopes, and to use these slopes for timber and wildlife only. More intensive cultivation of the flat lands is to make up for the retirement of the eroding hillsides. Gently sloping fields are to be terraced or strip-cropped. These changes, plus contour farming, good crop rotations, and the repair of eroding gullies and stream banks, constitute the technique of soil restoration.

The steep slopes now to be used for timber and game have heretofore been largely in pasture. The first visible evidence of the new order on a Coon Valley farm is a C.C.C. crew stringing a new fence along the contour which marks the beginning of forty per cent gradients. This new fence commonly cuts off the upper half of the pasture. Part of this upper half still bears timber, the rest is open sod. The timbered part has been grazed clear of undergrowth, but with protection this will come back to brush and young timber and make range for ruffed grouse. The open part is being planted, largely to conifers—white pine, Norway pine, and Norway spruce for north slopes, Scotch pine for south slopes. The dry south slopes present a special problem. In pre-settlement days they carried hazel, sumac, and bluestem rather than timber, the grass furnishing the medium for quick hot fires. Will these hot dry soils, even under protection, allow the planted Scotch pine to thrive? I doubt it. Only the north slopes and coves will develop commercial timber, but all the fenced land can at least be counted upon to produce game and soil cover and cordwood.

Creek banks and gullies, as well as steep slopes, are being fenced and planted. Despite their much smaller aggregate area, these bank plantings will probably add more to the game carrying capacity of the average farm than will the larger solid blocks of plantings on slopes. This prediction is based on their superior dispersion, their higher proportion of deciduous species, and their richer soils.

A new order enters—cooperative conservation. Here is one example of its work—the repair of eroding gullies.

The bank plantings have showed up a curious hiatus in our silvicultural knowledge. We have learned so much about the growth of the noble conifers that we employ higher mathematics to express the profundity of our information, but at Coon Valley there have arisen, unanswered, such sobering elementary questions as this: What species of willow grow from cuttings? When and how are cuttings made, stored, and planted? Under what conditions will sprouting willow logs take root? What shrubs combine thorns, shade tolerance, grazing resistance, capacity to grow



The integrated plan of land use now taking form in Coon Valley is typified by these charts which show a farm layout before and after reorganization.

from cuttings, and the production of fruits edible by wild life? What are the comparative soil-binding properties of various shrub and tree roots? What shrubs and trees allow an understory of grass to grow, thus affording both shallow and deep rootage? How do native shrubs or grasses compare with cultivated grasses for rootbinding terrace outlets? What silvicultural treatment favors an ironwood understory to furnish buds for grouse? Can white birch for budding be planted on south slopes? Under what conditions do oak sprouts retain leaves for winter game cover?

Forestry and fencing are not the alpha and omega of Coon Valley technique. In odd spots of good land near each of the new game coverts, the observer will see a newly enclosed spot of a half-acre each. Each of these little enclosures is thickly planted to sorghum, kaffir, millet, proso, sunflower. These are the food patches to forestall winter starvation in wild life. The seed and fence were furnished by the government, the cultivation and care by the farmer. There were 337 such patches grown in 1934—the largest food-patch system in the United States, save only that found on the Georgia Quail Preserves. There is already friendly rivalry among many farmers as to who has the best food patch, or the most birds using it. This feeding system is, I think, accountable for the fact that the population of quail in 1934-35 was double that of 1933-34, and the pheasant population was quadrupled. Such a feeding system, extended over all the farms of Wisconsin, would, I think, double the crop of farm game in a single year.

This whole effort to rebuild and stabilize a countryside is not without its disappointments and mistakes. A December blizzard flattened out most of the food-patches and forced recourse to hopper feeders. The willow cuttings planted on stream banks proved to be the wrong species and refused to grow. Some farmers, by wrong plowing, mutilated the new terraces just built in their fields. The 1934 drouth killed a large part of the plantings of forest and game cover.

What matter, though, these temporary growing pains when one can cast his eyes upon the hills and see hard-boiled farmers who have spent their lives destroying land now carrying water by hand to their new plantations? American lumbermen may have become so steeped in economic determinism as actually to lack the personal desire to grow trees, but not Coon Valley farmers! Their solicitude for the little evergreens is sometimes almost touching. It is interesting to note, however, that no such pride or tenderness is evoked by their new plantings of native hardwoods. What explains this difference in attitude? Does it arise from a latent sentiment for the conifers of the Scandinavian homeland? Or does it merely reflect that universal urge to capture and domesticate the exotic which found its first American expression in the romance of Pocohontas, and its last in the Americanization of the ringnecked pheasant?

Most large undertakings display, even on casual inspection, certain policies or practices which are diagnostic of the mental attitude behind the whole venture. From these one can often draw deeper inferences than from whole volumes of statistics. A diagnostic policy of the Coon Valley staff is its steadfast refusal to straighten streams. To those who know the speech of hills and rivers, straightening a stream is like shipping vagrants —a very successful method of passing trouble from one place to the next. It solves nothing in any collective sense.

Not all the sights of Coon Valley are to be seen by day. No less distinctive is the nightly "bull session" of the technical staff. One may hear a forester expounding to an engineer the basic theory of how organic matter in the soil decreases the per cent of run-off; an economist holds forth on tax rebates as a means to get farmers to install their own erosion control. Underneath the facetious conservation one detects a vein of thought—an attitude toward the common enterprise—which is strangely reminiscent of the early days of the Forest Service. Then, too, a staff of technicians, all under thirty, was faced by a common task so large and so long as to stir the imagination of all but dullards. I suspect that the Soil Erosion Service, perhaps unwittingly, has recreated a spiritual entity which many older conservationists have thought long since dead.

Forestry and fencing are not the alpha and omega of Coon Valley technique. Near each of the new game coverts food patches are planted to forestall winter starvation among the wild life.

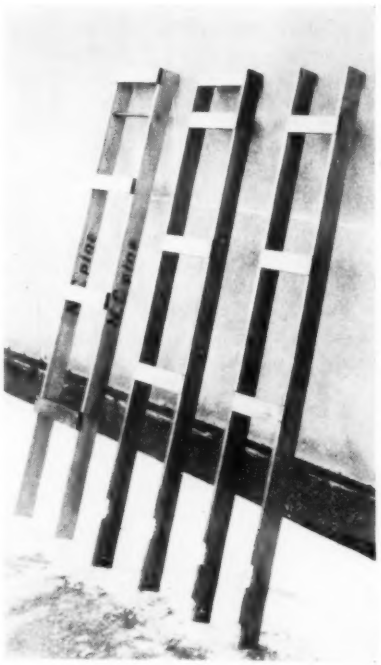
WOOD'S CASE AGAINST HAUPTMANN

PICTORIAL HIGHLIGHTS OF THE PART WOOD TECHNOLOGY PLAYED IN THE LINDBERGH KIDNAPPING TRIAL

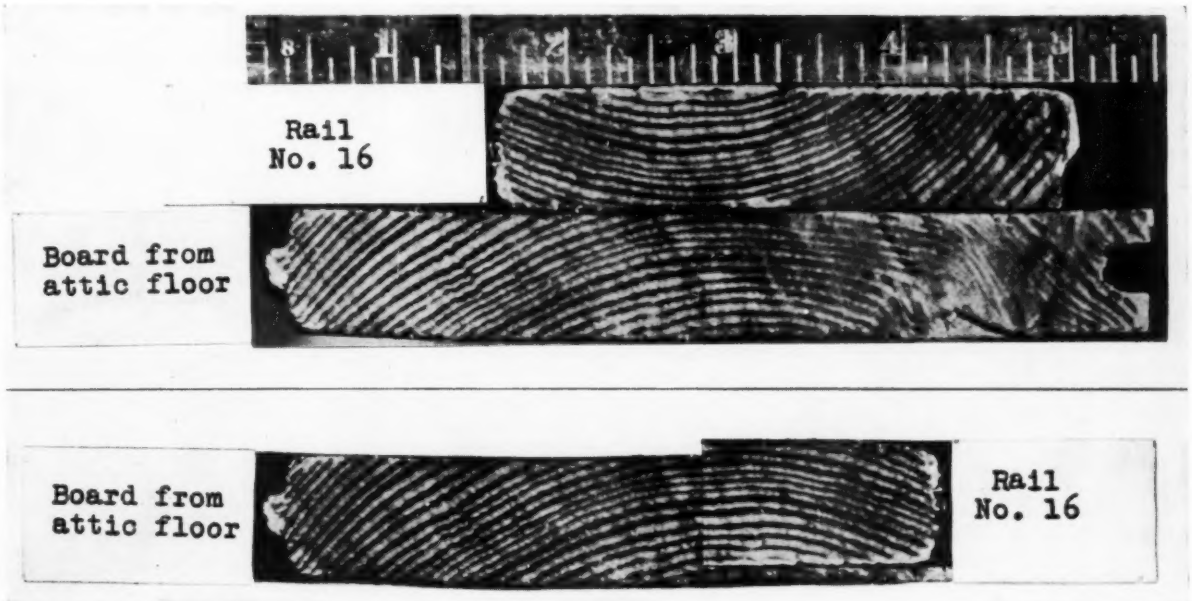
(Photographs by the United States Forest Products Laboratory)

THE story told at the trial of Bruno Richard Hauptmann by Arthur Koehler, wood technologist of the United States Forest Products Laboratory, at Madison, Wisconsin, opens up a new departure in crime detection, showing how by patient work the expert can decipher points of evidence from wood that place it almost in the same class with fingerprints for circumstantial value in identifying the man who misuses it.

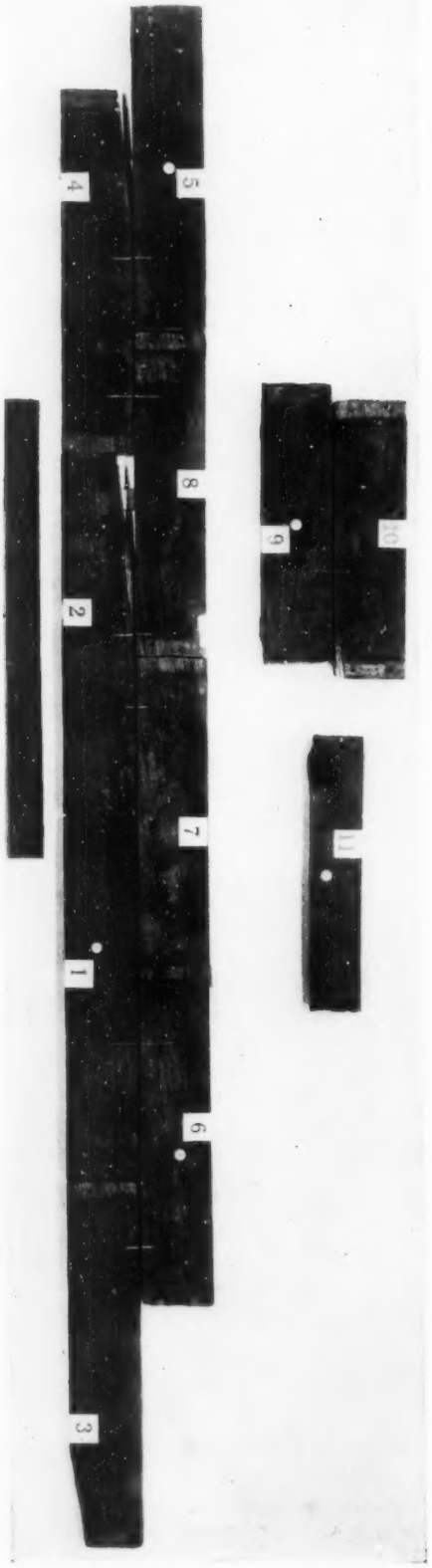
For more than twenty years Mr. Koehler has been connected with the Forest Products Laboratory, where he is now chief of the section of Silvicultural Relations. In this work he is concerned with all the effects of growth conditions on the quality and structure of wood, such conditions including geographical location, forest site, climate, stand management and logging practice. The microscopic identification of hundreds of wood species in their many variations of growth is a specialty of his, acquired through years of technical training, which along with wide experience with the various grades of lumber, has made his opinion of decisive value in many controversies. He was called into the Lindbergh kidnapping case through contact of Colonel H. Norman Schwarzkopf, superintendent of the New Jersey State Police, with Wash-



A model of the ladder found broken and abandoned on the Lindbergh estate the morning following the kidnapping, as constructed by Mr. Koehler from measurements of the original. The three sections could be nested together to facilitate handling, or could be fastened end to end by means of birch dowels. Mr. Koehler's identification of the species and commercial designation of every piece of lumber in the original ladder, and his tracing of the "North Carolina" pine uprights of the lower section to a lumber yard in the Bronx where Hauptmann was once employed were dramatic features of his investigation.



Above, end view of the famous Rail 16 of the original ladder tipped back on top of the board from the floor of Hauptmann's attic, showing similarity in grain. Below, a part of the end grain of Rail 16 superimposed on the end grain of the attic floor board. The growth rings, Mr. Koehler testified, show unquestionable agreement as to curvature, number, variation in width of growth rings, and percentage of summerwood.



Left—"Trees never lie," the master of wood technology told the Hauptmann jury in explaining the unusual demonstration shown at left. Eight of the ponderosa pine rungs from the ladder matched end to end and side by side by Mr. Koehler to show that they were cut from the same board. This board, the wood expert declared, was first ripped lengthwise with a hand saw. The rough edges were then planed with a hand plane which left identifiable marks like those on the edges of Rail 16. The two resulting strips were then cut crosswise to right length for the rungs. Two other pine rungs, he demonstrated, were similarly cut from different boards. One was Douglas fir, the grain of which matched that of the end of one of the fir rails.

Right—How the retail lumber yard from which the bottom rails of the ladder came was found. Mill planers marks due to an irregularity in one of the planer knife edges definitely helped trace the "North Carolina" pine. The interesting study at the right shows the minute defects in planing—shallow gouges on the face of one of the ladder rails and on a sample obtained from the Bronx lumber yard where Hauptmann was at times employed. Duplicate marks like these, Mr. Koehler testified, could originate only at the same mill.

ington officials of the Forest Service. In close cooperation with the New Jersey authorities, Mr. Koehler immediately set to work on the "kidnapping" ladder—a light affair built in three sections that could be packed together, and found broken and abandoned on Colonel Lindbergh's estate the morning following the baby's tragic abduction. Continuing his investigations right up to the time of the trial, his evidence made the ladder literally "come home to roost" in Hauptmann's place of employment, in his garage-workshop, and in the attic over his head.

Microscopic examination and study of the general characteristics of the wood resulted in the identification beyond reasonable doubt of the species and commercial designation of every piece of lumber in the ladder. There were also tool, machine, and nail markings that proved of special significance.

Mr. Koehler's sensational follow-up of the machine planing of the "North Carolina" pine uprights of the lower ladder section was related step by step at the trial. He explained how the material was traced beyond question to one particular planer at McCormick, South Carolina, by means of the number of knives in the face and edge cutters and the rate of feed, all as shown by impressions on the wood of the ladder itself. His first step was to determine just how many of the 1,600 mills in the North Carolina pine region had planers with the same number of knives in the cutters as the one used in dressing the two bottom rails of the ladder. He finally eliminated all but twenty-three, and on investigation only one of these, the Dorn Mill, at McCormick, produced a planer which showed the same distance between "revolution marks" as on the ladder rails.

After that, with a dated list of shipments and the special clue of some very peculiar small marks that must have developed between two successive sharpenings of the planer blades, a long search of lumber yards throughout the East began, to end finally with a complete matching of the ladder stock with a single shipment to one yard, that of the National Lumber and Millwork Company, in the Bronx, New York City.

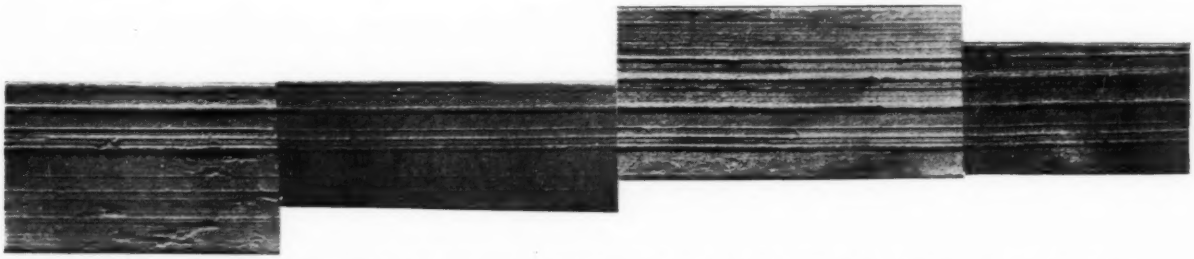
This discovery was made in November, 1933, but itemized purchases from the yard were not on record, since the company was operating on a cash basis. When Bruno Richard Hauptmann was arrested ten months later, however, it developed that he had been employed at that yard at different times, and that he had actually purchased lumber of some description there less than a month after the shipment in question was received and, significantly, two months before the kidnapping.

Even more dramatic was Mr. Koehler's demonstration before the jury at the time of the trial of the identity of the hand-plane marks found on the ladder with the scorings made by Hauptmann's own plane, which was nicked in a particular way. Line for line, the pattern came out the same as Mr. Koehler dressed a piece of pine clamped on the judge's bench. He had taken note of the hand-plane markings on the ladder at his first inspection and had given notice to seize the tool kit of any suspect located. For more than a year this mute record inscribed on wood lay ready and waiting to fasten itself grimly and unerringly on some particular owner.

Of irresistible import was the scientific matching of one ladder upright with a sawed-off floor board in the attic of Hauptmann's flat. There were four square-cut nail holes spaced along the upright in question. Nails pushed through these holes fitted exactly, in spacing and direction of driving, the holes in four joists from which part of the floor board was missing. The matching was a mathematical certainty in this respect, as well as a number of others. The square nails with which the fitting was made came from the attic floor itself. While the upright had been narrowed and shortened somewhat from the original piece, it lined up parallel to the next board, and its ring count, ring pattern, and even its surface figure were definitely shown to be a continuation of those features of the cut board.

All told, eight of the ten ponderosa pine ladder rungs were matched end-to-end and side-to-side by Mr. Koehler so as to show that they were cut from a one by six inch square-edged board. The annual rings on the ends of these rungs, which consisted entirely of sapwood, recorded a period of eighty-seven years in the life history of the tree that grew them. Analysis of the planer marks on these rungs eliminated all but two possible mills, which might have manufactured the lumber from which they were cut. While this investigation was in progress, the arrest of Hauptmann occurred, and Mr. Koehler was forced to discontinue his search to testify at the trial.

A final piece of evidence was the lack of a three-quarter-inch chisel in Hauptmann's kit when it was seized. A chisel of that size was found on Colonel Lindbergh's estate the morning after the kidnapping, and Mr. Koehler pointed out that this chisel was of identical make and pattern with a narrower one in Hauptmann's set. Further, he was able to fit the suspected tool perfectly into a chisel mark which he discovered in a recess of one of the uprights of the ladder.



Equally as remarkable as the matching of Rail 16 with the attic board was Mr. Koehler's demonstration of the identity of the hand-plane marks found on the ladder with the scorings made by Hauptmann's own plane. This plane, found in Hauptmann's garage, was dull and full of nicks, and when used on pieces of pine wood, left a peculiar pattern of ridges exactly reproducing the plane marks found on the kidnapping ladder, as vividly illustrated above. The section of pine on the left was planed by Mr. Koehler with Hauptmann's plane in the court room, as was the third section from the left. The second section shows the edge of Rung No. 6 from the ladder, and the one on the extreme right shows the edge of Rung No. 10. Note the exactness of the plane pattern in all sections.

NATURE'S THREE-FINGERED VILLAIN

Some New Facts Concerning the Cause and Cure of Poison Ivy

By G. ALBERT HILL

Photographs by the Bureau of Plant Industry

TO THE medical men *Rhus dermatitis* means an inflammation of the skin produced by a plant of the *Rhus* group—poison ivy, poison oak and poison sumach for instance. The commonest of these poisonous plants, at least in the eastern part of the United States, is poison ivy.

This plant grows abundantly along stone walls, climbs the trunks of isolated trees, and is found as a running vine at the edge of many patches of underbrush. Although it is dangerous, it is beautiful. In the early spring its characteristic leaves, with three leaflets, appear first as shiny red objects which soon become a lustrous green as the growing season advances. In the fall early frosts paint the ivy leaves as gorgeous a red as they do the maples, and many there are who have been badly poisoned while gathering sprays for decoration. As the leaves fall the "berries," technically known as drupes, become more evident. They are gray, the clusters resembling bunches of small grapes. When fully ripe they are quite harmless. The fruity part, surrounding the seed, is rich in fat, and because of this the berries float on water. New growths of ivy are often started in this manner. Also birds seem to like the fatty material as a food. They remove this from the seeds in their crops, and then eject the seeds from their beaks. This accounts for the origin of many of the isolated patches of poison ivy.

Poison Ivy—three-fingered villain of the plant world—is as beautiful as it is dangerous, especially when it spills its luxuriant color over an old pasture fence.

The poison is distinctly different from the sap of the ivy, and is believed to be a device of Mother Nature to protect this particular child. It is present in many parts of the plant in little channels known as resin canals. These are found in the roots, the bark, the leaves, and in certain parts of the flowers. The wood itself lacks these canals and, for a like reason, the ripe drupes are not poisonous.

Contact with the poison is essential to initiate a case of ivy poisoning. This is not equivalent to saying that one must touch the ivy plant to become poisoned, although this is, of course, the most certain way of experiencing *Rhus dermatitis*. Droplets of the poisonous oil are left on the coats of dogs, cattle, and other animals which may have bruised ivy plants as they roamed the woods or pasture lands. If the droplets are subsequently brought in contact with the skin of a person patting the dog or fastening the cattle in a barn, the person involved may be severely poisoned, more than likely without having even seen the ivy plant which is responsible for the attack. In a like fashion cases of ivy poisoning result from golf balls driven out of bounds, from golf clubs used to part the underbrush in searching for lost balls, from gun stocks which have rubbed against ivy plants, and from farming tools.

The common belief that cases of ivy poisoning may be acquired by merely passing a clump of ivy does not seem to be borne out by carefully conducted laboratory experiments. The poison is not sufficiently volatile to cause poisoning in such a case. If a bruised ivy leaf is fastened on the concave side of a watch glass and this is then fastened to the skin of a person, known to be sensitive to the ivy poison, in such a manner as to bring the leaf within half an inch of the sensitive skin, and kept there for hours, no poisoning results.

A common method of becoming poisoned by ivy, without direct contact with the plant, is most often observed in the fall when underbrush is cut and burned. Under these circumstances tiny droplets of the poisonous oil are carried into the air on the small particles of solid matter which make up the smoke. When the smoke with its "aviating droplets" comes in contact with sensitive skin, the droplets cause a perfect case of *Rhus dermatitis*. It will be noted that poisoning so acquired is not the result of true volatilization of the toxic material.

No one can long be interested in poison ivy without having individual differences forcibly brought to his attention. It is a fact that not a few people are quite immune to the effects of the oil in the resin canals of *Rhus toxicodendron* and of *Rhus diversiloba*, very similar plants, and both commonly called poison ivy. Some of these persons can crush ivy leaves in their hands and rub the bruised material on their faces without becoming affected in any way. These individuals are extraordinarily fortunate and blessed beyond most men. Immunity does not seem to be determined by race, sex, age, or season. At one time it was thought that negroes and Indians did not suffer from *Rhus dermatitis*, but that idea has long since

been blasted. Children suffer more frequently from ivy poisoning than do adults, but this is probably because of ignorance, possibly to some extent because of recklessness. According to an old adage, "The burnt child fears the fire," and one real case of *Rhus dermatitis* usually suffices to make even a rather young child wary, and since "the three-fingered villain" is so easily recognized, the child learns to avoid the ivy plant. Immunity to the ivy poison is an uncertain thing at best, for individuals lose their immunity without apparent cause. Less frequently, persons may acquire immunity.

Apparently the poison enters the cells of the body through the sweat and the oil glands, these little funnel-like openings in the skin serving as gateways for the toxic material. Just what happens when the poison has penetrated into the cells is for the doctors and toxicologists to say, and to date they have not revealed much. In the usual case a considerable time elapses before the victim is aware of his misfortune. This period may vary from a few hours to as much as several days. Usually the first indication of the poisoning is a vague itching and the sufferer rubs the spot without paying much attention to it. Incidentally any of the oil which may not have been absorbed may be transferred to some other hitherto unaffected part of the body by this means. Shortly after this stage a definite redness and swelling are noted together with increased sensitiveness of the poisoned area. In severe cases the swelling may be very marked and blistering sets in. Sometimes the blisters are small, but often they run together and produce a large, very tense swollen section. The extremely unpleasant itching persists through this stage which represents the peak of an ordinary case. Thereafter the liquid in the blisters is gradually absorbed and the dried and hardened skin is replaced. The affected part, upon recovery, is usually especially sensitive to the ivy poison since the area is covered with a new and thin layer of skin.

Branches of the Poison Ivy vine (Toxicodendron radicans) showing the leaves, fruit and aerial rootlets. The poison is not the sap of the plant but is present in little channels known as resin canals found in the roots, the bark, the leaves and certain parts of the flowers. Contact with this poison is essential to initiate a case of ivy poisoning.

Poison oak (Toxicodendron diversilobum) of California and the Pacific Coast. A portion of the branch is in flower. This is very similar to the ivy and just as dangerous to those not immune to the poison.

Most persons are not so scientifically inclined as to wish to watch a case of ivy poisoning run its course untreated, interesting as it may be. To avoid doing so one may, in the first place, avoid being poisoned at all. This means eternal vigilance while in ivy-infested areas either for sport or work, and prompt and frequent treatment to offset the action of any oil which may, unknowingly, have been brought in contact with the skin.

Since the poisonous oil is non-volatile and not soluble in water, it will remain where it has touched the body unless it is absorbed or removed. The removal may be accomplished by an alcohol rinse for the oil dissolves in alcohol. But this is hardly the wisest procedure as the poison will be spread by the alcohol unless every bit of the solution is carefully removed. Many substances, which are not soluble in water, can be emulsified by soap and the ivy oil is among these. Hence washing the parts of the body which may have been exposed to contact with the oil with a rich lather of (*Continuing on page* 255)

LOOKING AHEAD WITH THE C.C.C.

By AUSTIN F. HAWES

State Forester of Connecticut

RARELY has an innovation in American life met with such universal approval as the Civilian Conservation Corps. Whether or not it would have been enthusiastically received at an earlier period, or even after the forest industries had become stabilized, is extremely doubtful. The proper setting for the C.C.C. was created by the depression and accompanying crime wave.

Even the most conservative people and those who ordinarily oppose any new governmental activity, were quick to see the advantage of transplanting 300,000 young men from the unhealthy environment of street corners to the stimulating, purposeful life in the forest camps.

Many people comment on how much young men of their acquaintance have improved physically and mentally in a few months of camp life. Administrators of penal institutions admit a marked decrease in the younger age classes of inmates. Those who inspect the work projects know that a tremendous amount of valuable work has been accomplished. That all of these things have been successfully achieved is undoubtedly due to the fact that although the C.C.C. is new, it had the guidance of old and well trained organizations—the Army, Forest Service, and the National Park Service. Director Robert Fechner has shown excellent judgment in the way he has worked with these organizations, as well as with the various state forestry and park agencies.

Yet despite these accomplishments there have been many handicaps to overcome. Probably the greatest of these was the scarcity of trained supervisory personnel both in the Army and civilian branches. The Forest Service practically secured a corner on trained foresters when approval of state forestry camps was delayed. I do not wish to infer that this was done intentionally, but the policy pursued throughout the two years of the C.C.C. of offering foresters in the state services better salaries under the Forest Service has been a real handicap to the states in the administration of their camps.

The concession made to politicians by the Forest Service, and later by the Park Service, in requiring appointments to non-technical positions to be made from political lists has reduced efficiency in certain camps and has created more unfavorable comment than any other feature of the Corps' administration. With many good men seeking positions it is a distinct disadvantage to be forced to contact long lists of political nominees to find a man of passable attainments.

Then, too, while a limited number of promotions from the ranks of the enrolled members to the position of subforeman have been permitted, many enrollees fully capable of filling this position have been held back because of this political domination. This is one of the most regrettable features of the spoils system.

From the first it was evident to administrative officers that efficient accomplishment could be secured only by having a large number of well distributed small camps on work projects or by providing enough trucks to carry the men to the jobs. There are a number of disadvantages to the small camps which have been allowed under certain circumstances, and very proper rules limiting the number of men that can ride in a truck have resulted in a shortage of vehicles for this purpose. Many of the jobs are twenty or more miles from the camps, so a truck can be used for the transportation of only one crew. If the work projects were nearer camps, a single truck could place two or more crews on the job in the time required for the longer hauls. A generous allotment of additional trucks and other heavy equipment such as power shovels, tractors, and cement mixers would increase the production of the camps fifty per cent, while the cost would not exceed five per cent of the entire cost of the C.C.C.

The original setup, evidently made by men not acquainted with the true nature of the problem, called for an eight hour day. When it was realized that many jobs were such long distances from the camps that two hours or more a day were consumed on the road, a concession was made to permit six hours of actual work. Riding in a truck is not an arduous job. It does not require an hour to eat a banquet of two sandwiches. Much more work could be accomplished with a seven hour working day, and the men themselves would be better off so long as the present lack of recreational facilities continues.

For an emergency measure the C.C.C. was remarkably well organized. It was a stroke of genius having most of the pay checks sent directly to the needy families. The Army has turned in a fine job in spite of many difficulties. One of the most serious of these was the lack of experienced cooks. If an army travels on its stomach, it is no less true that woodsmen work on their stomachs. There are a great number of experienced cooks available. The Army was allowed to hire experienced carpenters and masons to build the camps, but was required to look to boys who had never baked a potato or boiled an egg for cooks. Most of the dissatisfaction in the camps can be traced directly to this situation. Happily the condition is improving.

Too much credit can scarcely (*Continuing on page* 254)

American Forestry Association to Hold Annual Meeting in the Adirondacks

THE 1935 annual meeting of The American Forestry Association will be held in the Adirondack Mountains of New York in September. Decision to this effect was reached by the Board of Directors at its meeting in Washington on March 22. The dates are September 12 and 13. The meeting will mark the sixtieth anniversary of the founding of the Association and will be held at Lake Placid in coordination with the three day program of the New York State Conservation Commission to celebrate fifty years of conservation in that State.

The two meetings being held at the same time and place will form one of the greatest conservation rallies in many years. Plan now to attend. Further announcement of details and program will appear in later issues of AMERICAN FORESTS.

Land of mysterious beauty—of a desolation colored by fantastic tales of peril and romance—the history of Death Valley dates back to the emigrants of 1849.

REMOVING THE "DEATH" FROM DEATH VALLEY

By T. R. GOODWIN

Photographs by Frasher's, Inc., courtesy The National Park Service

IN all of the United States no place appeals to the imagination, at least in name, as does Death Valley. Land of mystery, color, desolation and intense heat, more weird and fantastic tales have been written of its perils and colorful romance than of any other section of the country.

Its legends include the emigrant parties of 1849, prospectors with their picturesque burros, the Wells Fargo bandits, and twenty-mule team wagon trains. It has had its ghost cities of Bullfrog, Rhyolite, Skidoo, Greenwater and Panamint; and, woven through its narrative for the past thirty years, has been the world famous "Death Valley Scotty."

Beneath this drama, these legends, is the desert itself, a miracle of scenery and color. There are astounding rugged mountains riven to their very bases with sharply and fantastically eroded canyons, each with a great detrital "fan" spreading out from its mouth like river deltas. There is the endless sweep of salt plain and marsh, into which edge colorful foothills of black basalt, painted mineral impregnated clays, and varied masses of cemented gravel and conglomerate and up-edged rock strata.

On the east the Death Valley region embraces the Amargosa Range, made up of the Grapevine, Funeral and Black Mountains. The highest peaks in the Grapevine approach 9,000 feet elevation, with the average summit around 6,500 feet. On the west the storied Panamints form a mounain barrier that towers to more than 11,000 feet at Telescope Peak, lowering to the south to the bottom of Windgate Pass, slightly less than 2,000 feet above sea level. To the south and west are the Owlshead and Avawatz Ranges, while the Last Chance Range stretches north from the head of the Panamints to the actual head of Death Valley.

In the great basin formed by these mountains Death Valley sprawls its length for approximately 150 miles, with a varying width of from six to twenty miles. The portion below sea level extends from above Surveyor's Well at the north to the San Bernardino County line on the south, a distance of seventy-five miles. The Valley slopes toward Bad Water from north and south. This low spot of the North American continent dips to 280 feet below the level of the sea, draining not only a hundred miles of the Valley to the north, but receiving the bitter flow of the Amargosa. This alkaline river flows southerly through the great desert which lies east of Death Valley, turns in a great arc and flows northerly to empty into Bad Water. During the winter season it sometimes appears flowing on the surface, a luxury not often indulged in by desert rivers.

Sand dunes on the desert—itself a miracle of line and color held within the rugged, upthrust mountains.

The Valley floor itself is an enormous bed of salt impregnated with various other minerals in varying quantities. Test wells have shown that this salt goes down at least a thousand feet in a highly saturated solution. The actual water table is only two or three feet below the surface of the sink. However, evaporation and crystallization of the surface salts form a "cake" or surface so firm and strong that it will carry automobiles without any perceptible danger except in those areas where the impregnation of calcium chloride or other minerals prevents hardening.

After rains the Valley floor becomes a dazzling white, resembling a snow or ice field, but dust storms precipitate sufficient sand and silt to stain it in browns and yellows during most of the year.

Death Valley is a paradise for the geologist. The earth crust formation through nearly every geologic period is exposed for study. The rock strata are folded, upthrust and occasionally almost tied in knots from the tremendous pressures of past ages, while the famous "Death Valley Fault" is plainly visible even to amateurs. In many areas the painting of rock and clay by mineral stains is so varied and vivid as to astound even those familiar with the colorings of the Mojave, or the painted rock of Southern Utah, or the canyon of the Colorado River.

By reason of many deaths from exhaustion and exposure, Death Valley once had a sinister reputation. This reputation was not entirely deserved, although a maximum temperature of 134 degrees Fahrenheit has been recorded. There are probably several places in the Southwest that have similar temperatures, but the greatest discomfort in the hot season of Death Valley is the almost entire lack of moisture and the high rate of evaporation. This rate of evaporation takes water from the human system so rapidly that Gargantuan quantities are necessary for replacement. Lack of water, and not the heat has been the cause of most of the fatalities in the Valley.

Except for the period between the middle of May and the middle of September, the climate is generally healthful and delightful. Even during the hottest months there is a considerable and increasing amount of travel through the Valley, the only real danger being from over exertion in the sun and insufficient water supply. It is only in the Valley itself that this intense heat is encountered. The passes leading into the Valley are usually only an average summer temperature in the hottest weather, while the upper Panamint regions are cool and well wooded—a short and surprising drive from the furnace heat heat of the Valley floor.

The history of Death Valley is as colorful as its mountains and canyons. There is no authentic record of either early Spanish or Mormon occupancy or exploration. Apparently there were some early and limited mining operations in Furnace Creek Wash, but the first recorded white occupancy was the involuntary stay of the Bennett-Arcane party of gold-seekers during the winter of 1849.

This story is vividly told in the book, *Death Valley in '49*, by W. Lewis Manly, a member of the party. Briefly the story is of a great train of emigrants who left Salt Lake City, guided by a Mormon captain, over the San Bernardino route to the gold fields. Dissension over the long circuitous route led to a split in the party and a large number headed directly west from a point north of Las Vegas. After great difficul-

An Easter sunrise service—always impressive, becomes inspiring when held in the colorful setting of Death Valley.

ties and hardships, this party again split near the Amargosa Valley; the unmarried men whose group carried the name "jayhawkers," struck off in a northerly direction, reaching Death Valley through Daylight Pass. The other party, with two women and five children as additional handicaps in their dreadful journey, arrived in the Valley via the Furnace Creek Wash.

The towering Panamints seemed an unsurmountable obstacle. One by one their half famished oxen were slain for food. Water was scarce and these eastern emigrants knew not how to find it. The Jayhawkers burned their wagons and made their way through the Panamints by the Emigrant Pass, losing several members by thirst, starvation and exhaustion. Eventually they reached Los Angeles.

The Bennett - Arcane party camped near a spring on the eastern slope of the Panamints. With starvation near at hand, they sent two of their members, Manly and Rogers, out over the mountains westward in search of food. These two scouts managed, in spite of incredible hardships and exposure, to reach the San Fernando settlement and bring back a scanty supply of food. Then the entire party fought their way out, with the children tied to the backs of the hardiest of the oxen. The Bennett party arrived in Furnace Creek on Christmas Day. It was early in March when they staggered with bleeding feet into the welcome civilization of the settlement at San Fernando. Legend has it that one of the party, looking backward from the high slopes of the Panamints on the scene of their dreadful privations, exclaimed, "Goodbye, Death Valley," thus naming it for future generations.

From this date, 1849, up to about 1870, a number of exploration parties, both military and engineering, visited the areas around the Valley. The unexplored canyons became hide-outs for stage robbers and fugitives from justice. Prospectors began scattering out into the byways as the Comstock excitement died down in Nevada. Rich silver was found in Panamint City. In the eighties the value of the borax deposits was learned, and a story as romantic as any gold strike began with borax extraction above Furnace Creek and at Eagle Borax in the lower part of the Valley. Then came gold strikes at Bullfrog, silver at Rhyolite and Skidoo, copper at Greenwater—mushroom towns all. The booms died as suddenly as they began, cities of three thousand people disappeared almost overnight, vanishing population not even bothering to take their household goods with them.

But the borax industry did not die. Modern towns appeared at Ryan and Death Valley Junction, with a narrow gauge railroad connecting them, and a standard gauge out to connect with the Union Pacific. It was not until around 1920 that the location of an easier worked and more economically refined deposit of borax near Mojave caused a shift of operations, and mining of borax in Death Valley came to an end—at least for a time.

In the early mining of borax, the cotton-ball borax was scooped from the floor of the Valley and partially refined nearby. Great tandem wagons, with a water tank trailer, drawn by twenty mules, made the ten-day trip into Mojave over the mountains and desert. Six of the night camps were waterless. Feed for the stock was grown at Furnace Creek Ranch, close to the scene of operations. Irrigation water was brought down, as it is today,

Of breath-taking beauty are the poppy fields, shining like minted gold in the Antelope Valley.

Death Valley is a paradise for the student of desert forms. Grasses and cacti line the floor of the Mojave Desert for the bewildering dance of the Joshuas.

The development of Death Valley seeks to meet the demands of increased travel and at the same time to preserve unspoiled its outstanding natural features. This shows the road through Cork Screw Canyon in the Bad Lands of the Funeral Mountains.

from the springs in Furnace Creek Wash.

The next period of Death Valley development came from the insatiable curiosity of the automobile pilgrims. A few pioneer motorists fought their way through sections of the Valley and brought out stories of its fascinations and wonders. A toll road was built from Darwin to the Valley floor, and in 1926 a bungalow city and small hotel opened near the Sand Dunes. The borax operators opened guest accommodations at Ryan and Furnace Creek Ranch, and later built the splendid and modern Furnace Creek Inn. Automobile clubs and newspapers began to feature Death Valley tours, and travel increased rapidly. On February 11, 1933, some 1,600,000 acres, comprising the main floor of Death Valley, and extending up to the crest of the Panamints and Amargosa Ranges, became a National Monument by Presidential proclamation. This action was taken to open up this marvelous region to visitors, and to protect its fast disappearing wild life and flora, as well as historical relics. A unique feature of the regulations governing the monument was the incorporation of articles, not only protecting prospecting and mining within the monument boundaries, but actually encouraging these fast disappearing interests. Thus will visitors be able to catch some of the picturesque glamor of the men who spend their lives digging at the foot of a rainbow.

No appropriations, however, were made at first for the administration or development of the monument, but it was given over to the charge of Superintendent John R. White, of Sequoia National Park, who thus acquired guardianship of the highest point in the United States, Mount Whitney, and the lowest point, Bad Water, in Death Valley. They are only 100 miles apart in an airline. The National Park Service secured Civilian Conservation Corps help, and two companies moved into camp near Furnace Creek in late October, 1933. A skeleton organization was formed by a loan of a few key men from Sequoia National Park and from the supervisory personnel of the C.C.C. camps, and the administration and development of Death Valley National Monument began.

At this time the State of California had taken into its secondary highway system the route from Death Valley Junction through Furnace Creek Wash, and north and west across the Valley to the Toll Road. No improvements were made other than intermittent dragging. There was a dragged roadway in Furnace Creek Wash and a one-way track to Dante's View, and another to Bad Water. In all there was a reasonably passable road system of perhaps eighty miles. The writer attempted to make a reconnaissance and log of the automobile trails existing in the confines of the monument itself. He logged over 500 miles of so-called roads, consisting usually of a single pair of wheel tracks, used at infrequent intervals.

With the problem of making reasonably safe tourist travel over these desert roads (*Continuing on page* 253)

Furnace Creek Inn from the date gardens. Motor pilgrims first opened this fascinating region to the general traveler and now one may visit its wonders and lodge at the fine and modern Inn.

EDITORIAL

Forest Credits Needed Now!

IN THE May, 1934, number of AMERICAN FORESTS, Mr. Burt P. Kirkland discussed the necessity of providing adequate credit facilities for private forest owners, and outlined a form of organization calculated to assist such owners to embark upon long-time timber growing enterprises. Such loans would help to increase the country's wealth of forest growing stock and assure its orderly utilization at a rate commensurate with growth. The method proposed is patterned after the Farm Credits system and does not call for taxpayers' money.

It is an accepted fact the world over that permanent forest investments do not produce earnings comparable with commercial rates of interest. Consequently, and because of the importance of maintaining such enterprises, most governments try in one way and another to encourage forest ownership. This government already has greatly aided agriculture and should similarly aid forestry, by providing means whereby eligible borrowers can secure additional capital at low cost and for long periods.

Although the forest products industries have been conducted largely on a liquidation basis, their financial set-up in general is sound. Most of the important operators are in position to use forest credits for acquisition of additional mature timber and second growth to place themselves upon sustained yield basis, if they so elect. The time is most opportune. The Lumber Code provides for control of production and encourages sustained yield forest management. For several years, mill outputs have been so reduced as to bring about material slowing down of mature timber liquidation. Operators naturally have come to consider the pros and cons of permanent management.

A few of the boldest have gone forward to place their forests and mills on a permanent footing. Many, however, are deterred by uncertainty in respect to government competition in forest industry. They see the forest acquisition forces of the Federal Government driving ahead on a constantly widening front, invading areas which from a timber growing standpoint offer the most promising opportunities for private forestry.

There is a fear that the government is moving towards the nationalization of all forests and that eventually it will crowd private industry from permanent forest ownership. Until some definite assurance to the contrary is given, there cannot be much enthusiasm or progress in the development of private forestry. In fact, there may be a return of the old urge to cut-out and get-out as quickly as possible on the ground that the trends of government are depreciating the value of private stumpage. The very best assurance that the government desires to foster private initiative and private industry would be for it to provide sources of forest credits through which owners of forest lands could finance long range plans of forest management.

Legislation to this end is languishing in Congress in the form of a bill sponsored by Senator Fletcher in the Senate and Representative Caldwell in the House. The bill would amend the Reconstruction Finance Corporation Act to empower the Corporation to make twenty year loans, adequately secured, where they will contribute to the successful carrying out of a program of sustained yield forest management.

In a recent letter to President Roosevelt, Senator Fletcher brought home the social implications of permanent forest operations. "In my own State," he said, "as well as in the entire South, ... thousands of families who are dependent upon forest work are on the relief rolls. Yet, as you so well know, these and many other families could be self-supporting were the forest industries in operation. It is my belief that there is nothing which would be more appreciated by the southern states than a revitalization of forest industries."

The President's response was most sympathetic. He declared that he desires to advance the cause of forest conservation by every means at his command and that he is awaiting the most favorable opportunity to present to Congress a broad program of needed legislation. What the President has in mind undoubtedly is the so-called omnibus bill, mention of which has been made in recent numbers of this magazine. This legislation is urgent but action on Senator Fletcher's bill need not and should not await the broader program of new forest legislation. The present is not only the psychological time for forest credit legislation if private forestry is to be saved from complete demoralization, but the action, we believe, will do more to vitalize permanent forest management than any other single act.

LIGHTNING PROTECTION FOR TREES

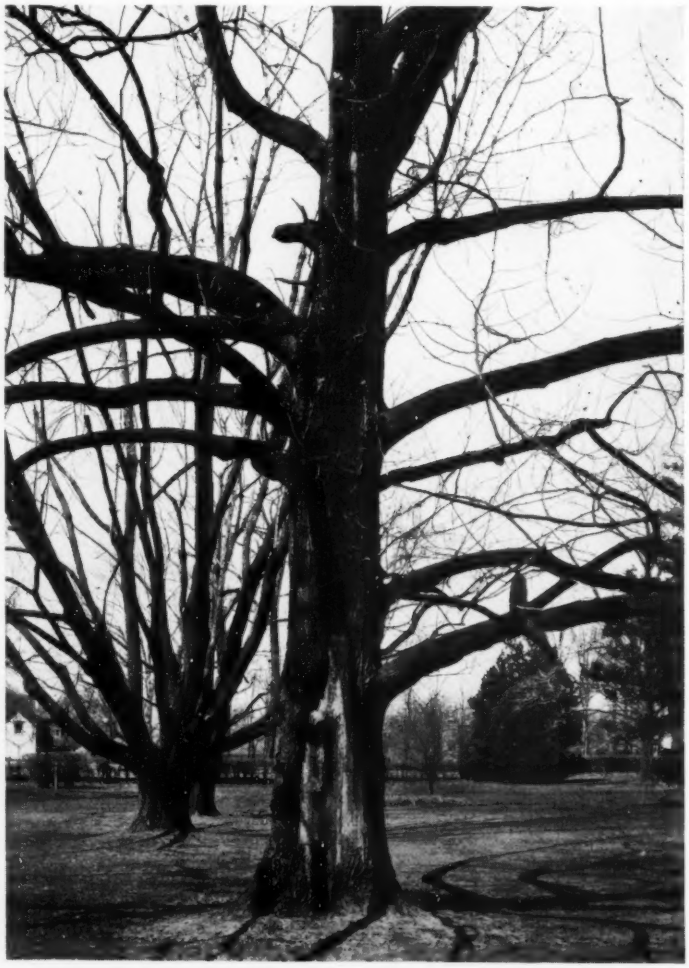
By H. STEVENSON CLOPPER

IT IS a pleasing fact that during the past decade there has developed a deeper appreciation and more serious consideration for the welfare of trees. One has only to visit historic landmarks, old homesteads, and, indeed, many modern estates to observe the many fine old specimens that are pointed out with pride by their owners.

At the same time one gazes upon the ruins of a stump or a vine-covered trunk which reveals the destruction wrought upon superb trees during lightning storms. It is beyond the imagination to conceive the size and value of many trees that are recorded in history and family tradition that would be alive today had they escaped this agent of destruction. And it is this source of tree injury that has caused tree owners and arborists to study the conditions surrounding these tragic incidents, with the hope of coordinating these facts with scientific knowledge and theory known in the protection of buildings and tall structures.

Such valuable information has been revealed and put into practice in the protection of buildings and other tall structures that practically no material damage occurs during lightning storms. The same principles that govern the protection of these man-made objects may and are being applied to living trees.

Trees seem to be the outstanding factor in supplying the necessary connection between the discharge of the overhead clouds and the ground, with the result that the degree of injury is in proportion to the discharge. Almost invariably the discharge of a bolt of lightning strikes at a point near the top of the tree, and continues at a more or less regular course to the base, resulting in a complete stripping of the bark from the trunk, and breaking off large leaders. In other cases it tears off a narrow strip of bark on the trunk between the point of entrance and the ground, and sometimes leaps from one point on the trunk to another, or escapes entirely to another tree.



This tulip tree has been completely killed by lightning. Such injury and destruction is not uncommon among highly prized trees and may be avoided by the application of the same principles of protection used today on man-made structures.

Wood is a poor conductor and offers considerable resistance to the flow of electric current. When lightning enters the outward part of the tree, the resistance created by the wood to the passage of the current is so great that the water in the cells of the sapwood is turned into steam. The bursting of these cells is of such force that frequently large trees are completely demolished. When the trees are in their active state of producing new growth, as in late spring and early summer, the most serious damage seems to occur.

Although crude, an ordinary clothes line wire stretched between a tree and a metal or wooden post has prevented injury to the tree below the point where the wire was attached to the trunk. Wire fences attached to trees seem to carry off the current and prevent damage to the bark covered by the fence. Some unusual cases have been observed where stumps located at the base of a living tree have deflected the current from entering the roots. The cross-arms of telephone and telegraph poles projecting within several feet of the tree trunk frequently deflect lightning discharges and prevent injury to the bark of the tree below the cross-arms. Electric and telephone wires, insulated or plain, have been the source of carrying off the discharge from the tree without injury to the trunk below.

In 1915, Dr. John B. Whitehead, Dean of the School of Electrical Engineering of Johns Hopkins University, was consulted about the problem of protecting trees from lightning injury. Through personal observation and his scientific knowledge of principles of lightning protection, he devised a system that is in use today. The system provides that a seven-strand wire, copper preferred, between four-

sixteenths of an inch and six-sixteenths of an inch in diameter, be attached to the trunk of a tree in as near a straight line as possible, connecting an air terminal located inside the top of the tree, as high as a climber can safely ascend, and a ground terminal. The air terminal consists of a galvanized clamp, attached to the limb, in which the wire is tightened by bolts. The wire projects twelve inches above the clamp and the strands are unraveled to form a fan shape. At several points on the trunk the wire is attached to the bark with short nails. For the ground terminal the wire is run hrough a three-quarter inch galvanized pipe, ten feet long, and in turn through another pipe of the same size, allowing the wire to project about fifteen inches beyond.

The wire is then unraveled and bent back parallel to the pipe, making it secure by tying the wire and pipe together with an extra piece of wire. The first pipe (horizontal ground rod) is placed in the ground twelve inches deep with one end near the base of the trunk. At the other end of the horizontal ground rod a vertical hole about two inches wide and eleven feet deep is bored into the ground. The second pipe, or what is known as the vertical ground rod, is driven into the hole, so that it forms a right angle to the horizontal rod. Solder is then poured into the top of the vertical ground rod to a depth of two inches to form a solid contact. Trees with a double leader and more than two far-reaching branches are sometimes provided with additional wires attached in the same way as described, with the exception that the wires are brought together at some convenient point on the trunk and tied. The bundle of wires is then run through two pipes of about an inch in diameter and placed in the ground the same way the three-quarter inch pipe was laid. It is imperative that the terminal end of the vertical ground rod be driven deeply into the ground so that the ground terminal is in moist soil at all times.

Some electrical engineers doubt the practicability and usefulness of lightning arrestors for trees. Some people are rather nervous over the thought of wires being attached to the trunks of trees, believing that they attract lightning. In the days when dwellings were not equipped with the modern system of water and gas pipes, with electric light, telephone and radio wires, lightning rods were used almost universally to protect property. Now, very few buildings are equipped with lightning arrestors, as pipes and wires attached to buildings form a ground to allow the electric charge to pass off unnoticed. Consequently, when an electrically charged cloud passes over the property equipped with modern conveniences there is no high voltage discharge between the two points. Likewise, if the tree is properly equipped with an air and ground terminal connected by stranded copper wire, there is small possibility of the ground current reaching great intensity at the base of the tree, as the wire or lightning arrestor allows the current to pass off into the ground and space at low intensity.

Showing the base of a fine old oak and the point of contact where the lightning conductor enters the ground.

Almost invariably the bolt of lightning strikes at a point near the top of the tree, continuing down the trunk to the base. This tulip tree has been properly equipped with a lightning rod.

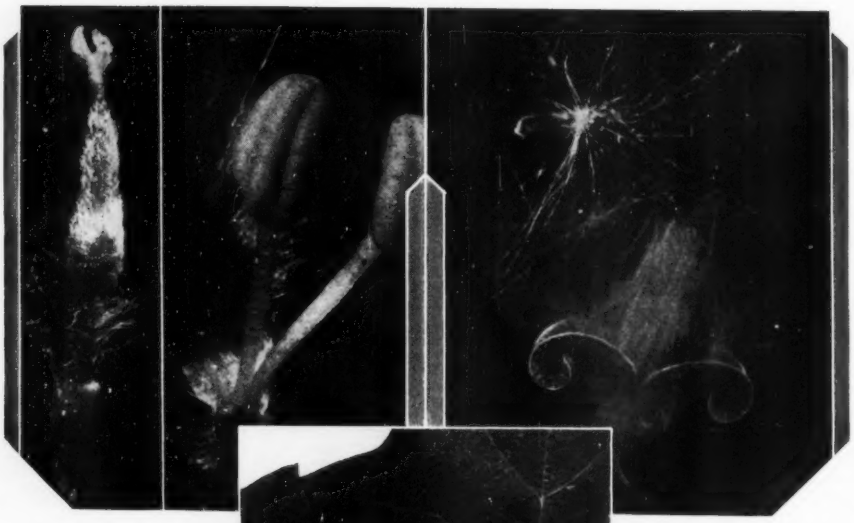
This theory has been put to practical application in many of the finest and oldest trees in Maryland, with the (*Continuing on page* 256)

TREE FLOWERS WITH THE MINIATURE CAMERA

By

WILLIAM M. HARLOW

TREES such as the tulip poplar, magnolia, and cherry are of course common and widely recognized objects during their flowering period because of their striking floral displays, but few people ever notice the flowers of the majority of our forest trees, in fact even realize that the trees have flowers. This is not surprising, since these organs are usually small and inconspicuous in many tree species, and are in evidence during a relatively short period in the spring. When seen through the magnifying eye and with the tremendous depth of focus of the miniature camera, however, the smaller flowers of certain trees often exhibit an unexpected beauty of structure not surpassed by their more showy associates. All the illustrations used are from enlarged photographs made directly with the camera and copying attachment, and without a microscope.



Above—The Willow flowers and dramatically releases its seed.

Below—The striking flower of Tulip Poplar.

Among the earliest of spring flowering trees are the willows, and few there are to whom the silvery catkins of the pussy willow do not forecast the retreat of winter. These catkins soon elongate, lose their silvery appearance, and develop a large number of tiny male, staminate, or female, pistillate, flowers arranged spirally upon the central axis of the floral spike. In contrast to most native trees, the male and female flowers are borne on separate individuals, and this accounts for the fact that only certain of the trees bear seed.

When carefully removed from the spike, and magnified against a black background, each small flower instantly acquires individuality, and is seen to consist of stamens, or a pistil in the axil of a hairy appendage known as a bract. The knob-like structure at the base of the flower is the nectar gland which presumably serves to attract insects in their search for nectar, or pollen. The petals and sepals which are the showy portions of most flowers are not present in the willows.

During the late spring or early summer, the pistils in the female flowers of willow mature into capsular fruits which split cleanly and liberate large masses of cottony material in which the greenish minute seeds are enmeshed, each equipped with a parachute of soft white hairs. The process of opening, called dehiscence, takes place fairly rapidly, and is fascinating to watch under a low power lens. Within a few seconds, the sides of the capsule curl downward, and from within comes an almost unbelievable amount of white cotton which billows outward, together with the several seeds. These do not long retain their capacity for germination, and possibly this accounts for the characteristic occurrence of willows, and also poplars and cottonwoods, along water courses where plenty of moisture is available during seed dispersal. Germination is very rapid under suitable conditions and within forty-eight hours young seedlings are produced with recognizable roots, stems and seed leaves. A moist piece of blotting paper in a closed dish makes a favorable germinating chamber, and young plants may be produced quickly in this manner.

Some of the elms, like the willows, are vernal flowering and mature their fruit in late spring but the flowers depart strikingly from those of the willow type. They are arranged in clusters, often upon long slender stalks and the stamens and pistils, instead of occurring separately in different flowers and on different trees are found in the same blossom. One illustration is of a single flower magnified. The stamens are conspicuous, while near the center may be observed the divided, hairy style. Subtending these floral parts at the base is the cornucopia-like

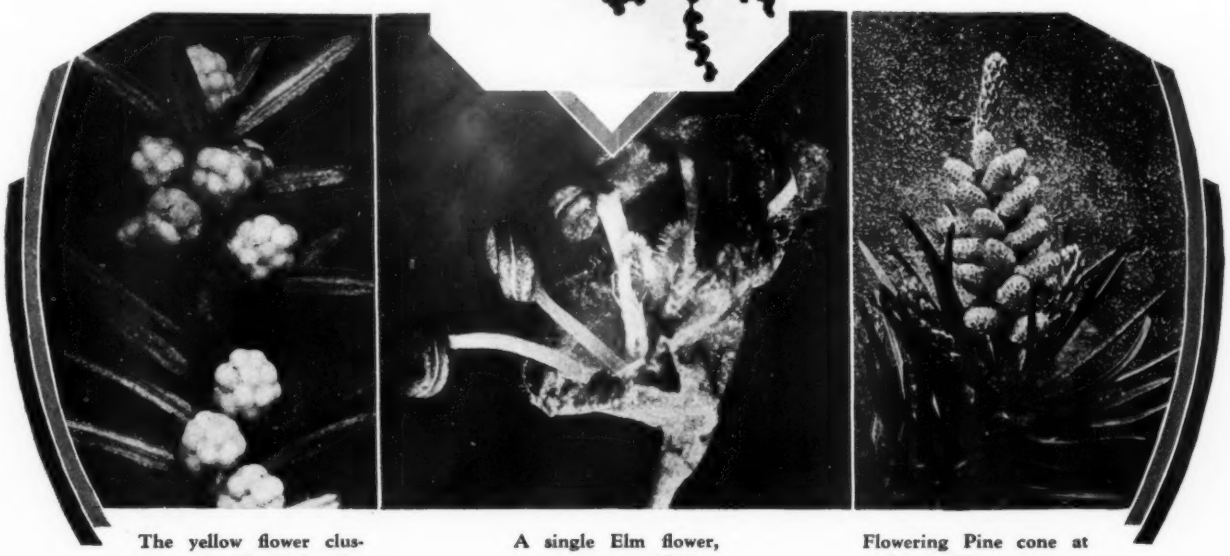
This handsome cone is the flower of the Larch.

Small and dainty are the flowers of the Ash.

calyx. The several pollen grains, seen as light dots against the dark background, serve to indicate the unusual depth of focus of the camera, since both flower and pollen were resting upon the same piece of glass when photographed.

The flowers of the oaks are examples of a third type of arrangement, with the stamens and pistils in separate structures but on the same tree. The photograph shows a flower bearing branchlet of red oak. The female flowers appear on a short upright spur in the angle formed by the stalk of the uppermost leaf on the left, and the twig. The male floral units are much more conspicuous and occur on long drooping filaments. In the pistillate the flowers are generally borne in clusters of two or more but only one usually develops into an acorn, the others aborting. Since the trees of the red oak group, which includes the true red oak, require two years to mature their fruit, small partly formed acorns may be seen on the branchlets of the previous season pro-

An Oak flower cluster.



The yellow flower clusters of Hemlock—distinctive and characterful.

A single Elm flower, greatly magnified.

Flowering Pine cone at pollen-shedding time—a golden galaxy!

viding the tree is destined to produce fruit in the following autumn. In contrast to the red oaks the white oaks mature their acorns in a single season.

The small flowers of the ashes are inconspicuous and simple in structure, but very bizarre when magnified. The essential organs, stamens and pistils are borne in separate clusters on the same or different trees; in the latter instance, as in the willows and poplars, only the pistillate tree produces seed.

Do coniferous trees bear flowers? Probably in most instances the answer would be "no," yet the conifers are included among the flowering plants, and certain species possess flowers of unusual beauty, both of form and color. The conifers are considered to be much more primitive than the broad leaved trees, and their flowers are much simpler in structure. The female flowers can no longer with propriety be called "pistillate," since there is no such structure present. Instead, the flower cluster is a cone of overlapping scales, with one or more naked ovules, destined to become seeds, borne at the base of each scale. In addition, the scales may or may not be accompanied by large or small scale-like bracts. In natural colors an ovulate flower of the larch would make an unforgettable picture with the bright scarlet of the cone contrasting sharply with the pale green of the young emerging leaves, and the straw brown of the scaly stem.

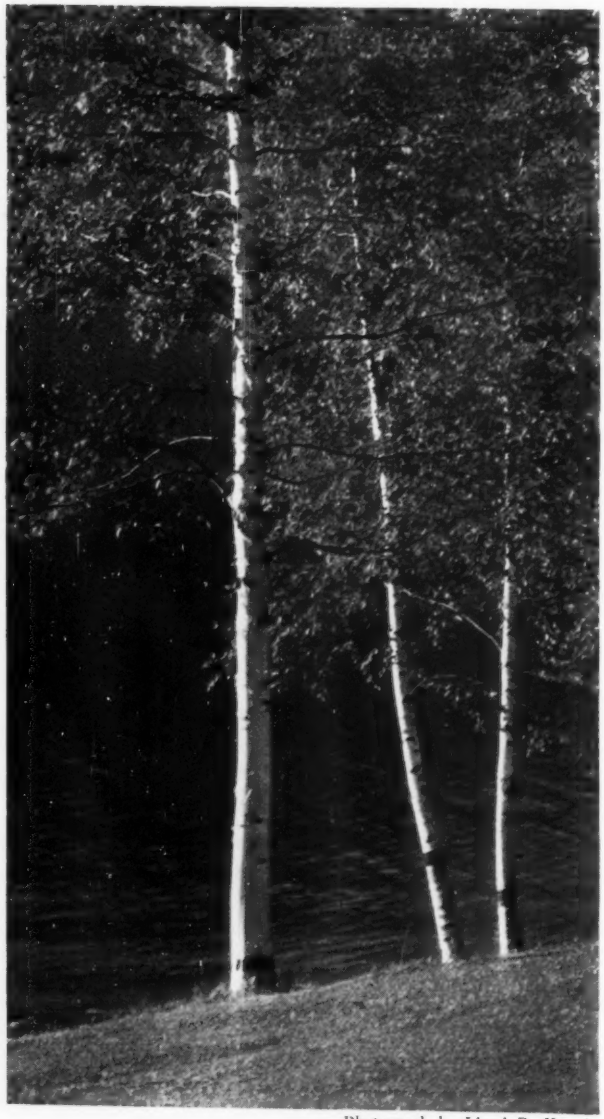
The conifers depend upon the wind to effect pollination, and the amount of pollen liberated from a single tree is sometimes amazing. If one shakes a flower-bearing branch at the time of pollen-shedding, he will find himself in a midst of a golden fog of untold billions of pollen grains. Such pollen "galaxy" is recorded here, although the technique of photography was by choice static!

The ovulate flowers of the pine develop in an interesting way. When first borne they are, as in other conifers, erect upon the branch. This position is presumably the best for catching the wind blown, drifting pollen grains. Some time after pollination, either during the same or the following season, the cone slowly turns over and assumes a pendent position on the branch. During the first season, very little growth takes place, but at the beginning of the second summer, the cone increases rapidly in size and arrives at maturity in the late summer or early autumn. From this life history, it is evident that the probable size of the ultimate seed crop can be forecast by observing the small one year old cones on a number of trees.

It is not possible in such a short article to more than introduce the varied subject of tree flowers, but the few examples chosen may suffice to reveal some of the interesting features of these intriguing structures in forest trees.

WHITE BIRCH: A MOTHER'S DAY POEM*

By Nell E. Mabey



—Photograph by Lloyd R. Koenig

"White satin for my mother's dress--look there!
Lace, too, lace for her shiny hair!" he cried,
And pointed where a white birch stood beside
A mound; he spoke, a David unaware . . .
There came a rush of great wings on the air,
And suddenly I knew she had not died,
Whose child of seven envisioned her a bride!
We fail our shining angels who despair.

And that is why when still each year on year
The May returning, trailing wreaths of grace,
Adorns with fairy charm the white birch tree,
The air is filled with whir of wings for me:
"White satin for my mother's dress," I hear,
"And for her shiny hair a bit of lace."

*The White Birch is the official Mother's Tree, sponsored by The American Forestry Association.

WILDERNESS TRAILS FOR 1935

ITINERARY OF THE AMERICAN FORESTRY ASSOCIATION'S "TRAIL RIDERS OF THE NATIONAL FORESTS"

Arrangements for the 1935 expeditions of the "Trail Riders of the National Forests" have been completed by The American Forestry Association. Three trips have been organized, the first into Montana, the second into Wyoming, and the third into New Mexico—at a cost not exceeding an average two-week vacation. A brief itinerary and the cost of each trip appears below.

Each party will be limited to twenty-five riders—men, women and older children. Every detail has been arranged for the convenience and enjoyment of the riders from the time they step on the train at Chicago until their return. Forest Rangers and other National Forest Officers will accompany or contact the parties while on the trail.

Write the Association at once for additional information—and for reservations.

EXPEDITION NO. 1

Flathead—Sun River Wilderness, Montana

$178 all inclusive, from Chicago back to Chicago (except meals on train).

JULY 6—Leave Chicago via Burlington Route and Northern Pacific.

JULY 7—En route.

JULY 8—Arrive Missoula. Headquarters, Florence Hotel. Get-together meeting. Night at Missoula.

JULY 9—Missoula to Lodgepole Creek—by auto to Monture Ranger Station, then pack train to camp. 10 miles.

JULY 10—Lodgepole Creek to Big Slide. Good fishing. 12 miles.

JULY 11—Big Slide to Young Creek. Excellent fishing. 9 miles.

JULY 12—Young Creek to Pearl Basin, via Danaher Creek. Then up over the Continental Divide. 13 miles.

JULY 13—Pearl Basin to Chinese Wall. Now in the Sun River country. Camp in alpine meadow. 15 miles.

JULY 14—Day of rest beneath the Chinese Wall.

JULY 15—Chinese Wall to White River Meadows. Recrossing the Continental Divide. 12 miles.

JULY 16—White River Meadows to Independence Park. Stop at forest fire lookout on Pagoda Peak. 15 miles.

JULY 17—Independence Park to Murphy's Cabin. Fishing. 10 miles.

JULY 18—Murphy's Cabin in Tango. Lunch at Big Salmon Lake. Good lake fishing. 17 miles.

JULY 19—Tango to Laird Ranch. Over Swan Range to beautiful Holland Lake. 15 miles.

JULY 20—Laird Ranch to Missoula. Leave Missoula via Northern Pacific.

JULY 21—En route.

JULY 22—Arrive Chicago.

EXPEDITION NO. 2

Wind River Wilderness, Wyoming

$182 all inclusive, from Chicago back to Chicago (except meals on train).

JULY 28—Leave Chicago via Chicago & Northwestern and Union Pacific.

JULY 29—En route.

July 30—Arrive Kemmerer, Wyoming. By auto to Gannett Peak Ranch, on Green River Lake, 8,000 feet elevation. Night at ranch. 150 miles.

JULY 31—Gannett Peak Ranch to Newfork Creek. Beautiful open country. 15 miles.

AUGUST 1—Newfork Creek to Section Corner Lake. Rugged country with good fishing. 10 miles.

AUGUST 2—Section Corner Lake to Long Lake. Spectacular scenery. 10 miles.

AUGUST 3—Long Lake to Pole Creek. Nearing timberline. 15 miles.

AUGUST 4—Pole Creek to Island Lake. Now in high country at top of timberline. 10 miles.

AUGUST 5—A day of rest at Island Lake. Good fishing and exploration.

AUGUST 6—Island Lake to Trail Creek. Still high rugged country. 12 miles.

AUGUST 7—Trail Creek to Grasshopper Glacier and return. A thrilling adventure. 8 miles.

AUGUST 8—Trail Creek to Lower Green River Lake. Fishing. 12 miles.

AUGUST 9—Green River Lake to Gannett Peak Ranch. Night at ranch. 9 miles.

AUGUST 10—Gannett Peak Ranch to Kemmerer by auto. Leave Kemmerer via Union Pacific. 150 miles

AUGUST 11—En route.

AUGUST 12—Arrive Chicago.

EXPEDITION NO. 3

Gila Wilderness, New Mexico

$190 all inclusive, from Chicago back to Chicago (except meals on train).

AUGUST 18—Leave Chicago via Santa Fe.

AUGUST 19—En route.

AUGUST 20—En route.

AUGUST 21—Arrive Silver City, New Mexico. By auto to Redstone for first camp. 38 miles.

AUGUST 22—By pack train, Redstone to Gila Hot Springs, via Alum Mountain. 10 miles.

AUGUST 23—Gila Hot Springs to Grudgings Cabin, visiting prehistoric cliff dwellings. 6 miles.

AUGUST 24—Grudgings Cabin to Prior. Big game country. 11 miles.

AUGUST 25—Prior to West Fork of Gila River. Fishing. 10 miles.

AUGUST 26—West Fork of Gila to Snow Park. Camp beneath Mogollon-Baldy Peak, 9,500 feet. 9 miles.

AUGUST 27—Snow Park to Turkey Feather Creek, with visit to forest fire lookout tower. Magnificent scenery. 11 miles.

AUGUST 28—Turkey Feather Creek to Middle Fork of Gila River. Good fishing, spectacular scenery. 9 miles.

AUGUST 29—Middle Fork of Gila to Willow Creek, via Iron Creek Mesa. Beautifully timbered country. Good fishing. Camp at the most beautiful spot in the wilderness. 10 miles.

AUGUST 30—Willow Creek to Silver City, by auto, via Negrito, Black Canyon and Beaverhead. 150 miles. Leave Silver City via Santa Fe.

AUGUST 31—En route.

SEPTEMBER 1—En route.

SEPTEMBER 2 (Labor Day)—Arrive Chicago.

FOREST SCHOLARS

By

CHARLES NEWTON ELLIOTT

A FEW years ago, the south was one of the most backward sections of the United States in knowledge and practice of forestry. Trees were a nuisance rather than an asset. Hordes of forest seedlings were eternally springing up where they were not wanted. They had to be chopped out of corn fields and cotton "patches," and they crowded out land which had been cleared for pasture. In many instances, virgin stands of timber were cleared for "new ground," and huge logs piled together and burned; there was no ready market and some disposition of them had to be made.

Today a new and different chapter is being written in the forestry annals of the south. Trees which were worthless a few years ago, now have a definite value. Land, which was wiped clean of its virgin timber and placed in cultivation, is being planted to trees again. Farmers, landowners, business men, have come to realize that trees represent a money crop, and in the light of this knowledge, the word forestry has been clothed with a new meaning. Much of this changed idea of forestry has come about through education. The Forest Services of state and federal departments, The American Forestry Association and the state associations, all have played important roles in the south in making this education possible.

In the state of Georgia, there has been developed within the past five years a program of forestry education that is yielding as far-reaching results as any educational program ever conducted in the state. The idea originated in a conference between Mr. C. A. Whittle, Educational Director of the Georgia Forest Service, and heads of the State Vocational Department. For a year, Mr. Whittle and his assistant devoted their entire attention to the development of the program. They traveled from school to school and in the course of the year, placed forestry courses in over one hundred and ten white and twenty negro Vocational Departments.

At each school they selected a ten-acre forest plot, for which they made management plans. In each forest they selected quarter-acre sample plots in which all trees were tagged with metal numbers. Each quarter-acre was studied under varied conditions. One was thinned, another burned, and a third left natural and studied in comparison to the ones adjoining it.

Each boy taking the forestry courses was required to establish a sample plot of five or more acres on his home farm, and on it carry out the same practices outlined on the school forest. In this way the basic principles of tree identification, seed collecting and seed bed work, fire suppression, thinning, planting and marketing, were studied. Each student became familiar with the ground work of all phases of forestry.

Vocational education is giving new life to forestry in the South. Such earnest young workers as these students at the Summer Camp at Young Harris, Georgia, are learning in the most practical way the value and use of trees.

Since the establishment of this work in 1929, over ten thousand boys in the state of Georgia have had some fundamental forestry training. And they have put into practice on their own farm forests and woodlots what they learned at school. As an example, last year the number of tree seedlings grown by the Vocational Agricultural boys in Georgia exceeded by far the number grown at both the state nursery at Albany and the Forest School nursery at Athens. These seedlings were planted throughout the communities where the schools were located. Thousands of acres were thinned and undesirable trees removed from the stands. One of the common thinning practices was to mark the trees to be cut for winter wood, thereby eliminating one condition which has been a habit of Georgia farmers since time immemorial, that of cutting the tallest, straightest timber trees for winter cordwood. Since the Vocational foresters have taken a hand, stands have been greatly improved instead of ruined.

One of the most remarkable aspects of the program is the fact that the boys have carried home the germ of forestry. I have known of a number of cases where the boy's father laughed at the idea of making his farm woodlot pay returns. In each case, however, the boy was inspired by what he had learned in his forestry class at school. He picked up his ax and went to work. He made his own demonstration plots and built fire lines around them. He thinned and used his thinnings for winter wood. He took over and planted the worthless, eroded land. Many times the results of his work were not outstanding the first year, but in not a single case was the student discouraged.

After a year or two, his father began to notice that trees

in the areas thinned were adding more growth in the spring than those in the adjoining woodland. Planted hillsides, green with trees were a more pleasing sight than the red, barren slopes on his farm and in the edges of his pasture. Trees on the unburned area of the demonstration plot had grown faster than those through which fire raged once or twice each year. The results opened the eyes of the older men and they began to take interest. Today many of these farmers who at first scoffed at the idea of forestry on such a small scale attend night classes held by the Vocational teachers in their communities and they have become converts, as staunch as any forestry ever had. They buy seedlings to plant on their eroded hillsides. They thin intelligently. Their enthusiasm spreads. They preach the gospel of forestry to their neighbors, and in a year or two, the entire community becomes forestry-minded. That has not happened in one lone community in the state, but in hundreds.

Four years ago a summer camp was established in the mountains of the state. One boy was chosen from each county in which a Vocational school was located, to attend this camp. He was selected by competitive merit, in which his knowledge and interest in forestry, his work at home and in the community, and his general scholarship and character, were considered. The boy who won this scholarship had the privilege of attending two summer camps, of three weeks each, during which he was given intensive and more advanced training in forestry by the personnel of the Vocational Department and the Georgia Forest Service. At the end of two summers, if the boy had satisfactorily completed the course prescribed by the two departments, he was awarded a certificate as Vocational Forester, showing that he was able to qualify for such minor jobs as fire patrolman, timber cruiser, lookout man, or foreman of logging operations.

The latest Vocational forestry camp was held at Tifton last summer. The practice now is to give the boys one year in the turpentine woods of the Coastal Plain and one year in the hardwood forests of the mountains, that they (*Continuing on page* 254)

Shots made at random at the school forest of the Moultrie Vocational High School in Colquitt County, Georgia. The class work on the vocational school forests is managed in cooperation with the State Department of Forestry.

***Above*— A class in planting on the school woodlot.**

***Middle*—A timber cruising class in the field.**

***Below*— The vocational class during a rest period.**

FIELD AND FOREST FOR BOYS AND GIRLS

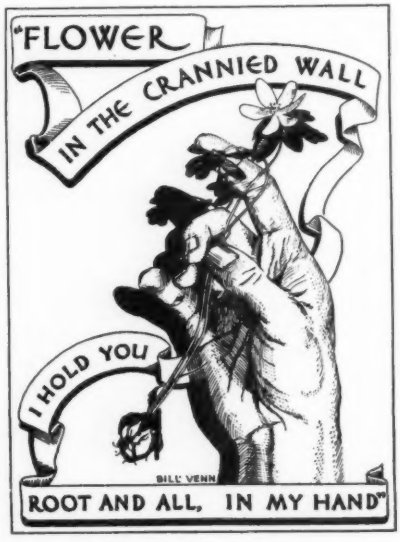
THE GOD OF NATURE

By JOHN HARVEY FURBAY, Ph. D.

Illustrated by William D. Vennard

ONE of the last of the noble Inca race was observed gazing one day into the face of the sun, instead of standing with head bowed in worship before it according to tribal custom. His father, on seeing him, rebuked him for his irreverence. The son replied: "I am not irreverent. There must be some power behind the sun, for it follows its course as an obedient servant. Surely it owns a Master. I seek for One who directs its course."

This story well illustrates the point of view which has promoted much of scientific research during man's history. Nature has been the universal "treasure chest," and her stores are yet plentiful. At first we are satisfied merely to admire the treasures which we draw from the chest. Perhaps we may even learn to utilize them in everyday life. Finally there is no longer any "wonder" associated with these things, and we take them for granted as commonplace. Then, some day we suddenly awaken and say to ourselves "How did this happen?" "Who started it?" At that moment we are conscious of something that transcends the natural.



A learned botanist of the nineteenth century was found at work in his laboratory one day. He was watching through the microscope the unfolding of the life germ in a grain of wheat. When asked what he was doing, he replied: "I am watching God at work." Nature is one of God's living parables and in it man finds revelations of God Himself. To love Nature is to love God, and to study Nature is to study God in all of His Divine versatility.

In Nature we find the greatness of His mind. We see countless everyday occurrences which seem like miracles to man. They evade all attempts at analysis.

Astronomers take our breath away as they discourse on the size and splendor of the universe. Throughout this universe, from the way planets swing in wide orbits, to the delicate structure of a butterfly's wing, there is a definite plan. It is an orderly plan—otherwise there could be no natural science. We could not be sure that hydrogen and oxygen would unite to form water, or that a flower would attract the particular kind of insect adapted to carrying its pollen. It is a consciousness of this mighty plan that awes every naturalist. Tennyson expressed the humility of every Nature-lover when he wrote:

"Flower in the crannied wall,
I pluck you out of the crannies—
Hold you here, root and all, in my hand,
Little flower—but if I could understand
What you are, root and all, and all in all,
I should know what God and man is."

The patience of the Creator is seen in many of His creations. Time seemed to be no consideration. Mountains were worn down, and seacoasts lifted up. Forests were planted, and vegetable deposits were buried and placed under pressure for thousands of years in order to produce coal, gas, and oil. Goethe, realizing how close to God the observer of Nature could approach, called Nature, "the living visible garment of God."

When the Pilgrims landed in America, they found fragrant wild flowers growing abundantly all over New England. As the population of the colonies increased, great numbers of wild flowers were plucked each year, people making trips to places where they were growing, and pulling them up ruthlessly.

And so began wholesale destruction of our wild flowers, which has continued as our population spread Westward, from the Atlantic to the Pacific. Flowers which

were once in great abundance are no longer seen except in special reservations. Why? It is only because we have been selfish, and have not thought about the future of these flowers.

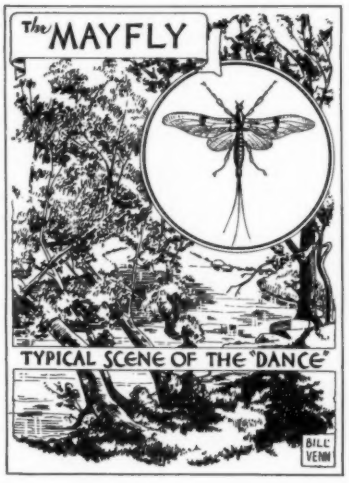
In places where the mountain laurel has grown, great devastation has taken place. The laurel is easily seen from quite a distance when in full bloom, and murderers of the wild are attracted to it. It should not be necessary for the beauty of the scene to be marred by signs saying "spare the laurel." What a sad end it would be if the woods should be robbed of all its laurel, and we Nature-lovers should never again see another "laurel time" —the loveliest time of the year.

Few flowers are as pretty after they are picked as they were before, and some lose all of their charm. The bloodroot —that lovely flower whose delicate white petals open only in sunlight and close at night—is distinctly a child of the woodland, and will not stand being carried out of the woods. Yet many people pluck these flowers mercilessly, only to discard them soon — probably before they reach home.

Let us all, from now on, remember that to pick all of the flowers we find is to help kill them out, and to rob ourselves and others of these flowers in future years.

Another miracle of Nature is found in the insect world. It is the Mayfly, which completes its adult life in one day. During May and June, on warm evenings, great swarms of these little insects can be seen flying over lakes and rivers. They have spent about three years as larvae (grubs) in the water and have just emerged with their first wings. They immediately fly to some object, alight, shed their entire skins, even over their wings. Then, in their new, bright coats, they soar out over the water to live their few hours of adult existence before they must die.

These small insects are really not "flies" any more than Dragon-flies or Butterflies are. They belong to a group of their own. They are called "ephemeral" insects because they "live but a day." They usually have two pairs of wings, and the front pair is larger than the back pair. Their two or three long, sweeping "feelers" which trail behind them as they flit through the air, are longer than the body proper. They have two large eyes and three small ones (ocelli) with which to see their mates in the twilight.



Many stories have been written about the "dance" of the Mayflies. After they emerge from the water and shed their skins, their short life of romance unfolds. Thompson, the noted British naturalist, described this event thus: "The life of love begins. Merrily they dance up and down, dimpling the smooth water into smiling with a touch—chasing, embracing, separating. See the filmy fairy wings, the large lustrous eyes of the males, the tail filaments gracefully sweeping in the dance!"

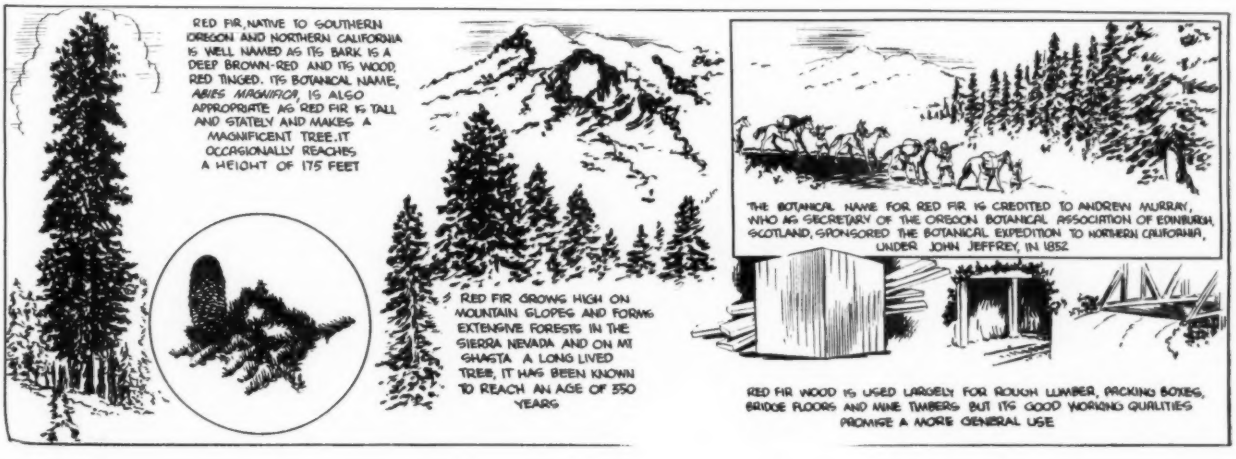
Three long years, in most cases, have been spent waiting and preparing for this wedding day. They revel in their love-making as though unconscious that death is so close at hand. The air may be clouded with them as thick as snowflakes for a while. They mate during this rapturous "dance," and the males die almost immediately, while the females hurry to the water's surface where they deposit their eggs, and then they too die. The ground may become covered with their lifeless forms, and millions of them may be seen floating downstream for the fish to devour.

Their brief life has only one purpose, and they themselves have only one impulse, to mate. When this is accomplished, they are ready to die. Their eggs, which may have been deposited on the surface of the water, or on stones under water, soon hatch into more larvae which will, in turn, spend from one to three years in the water, and then emerge for their one glorious day of romance.

Their adult life seems very short compared with their larval period, but there are some (*Continuing on page* 255)

TREES AND THEIR USES

No. 5 - - - RED FIR


RED FIR, NATIVE TO SOUTHERN OREGON AND NORTHERN CALIFORNIA IS WELL NAMED AS ITS BARK IS A DEEP BROWN-RED AND ITS WOOD RED TINGED. ITS BOTANICAL NAME, ABIES MAGNIFICA, IS ALSO APPROPRIATE AS RED FIR IS TALL AND STATELY AND MAKES A MAGNIFICENT TREE. IT OCCASIONALLY REACHES A HEIGHT OF 175 FEET
RED FIR GROWS HIGH ON MOUNTAIN SLOPES AND FORMS EXTENSIVE FORESTS IN THE SIERRA NEVADA AND ON MT SHASTA A LONG LIVED TREE, IT HAS BEEN KNOWN TO REACH AN AGE OF 350 YEARS
THE BOTANICAL NAME FOR RED FIR IS CREDITED TO ANDREW MURRAY, WHO AS SECRETARY OF THE OREGON BOTANICAL ASSOCIATION OF EDINBURGH, SCOTLAND, SPONSORED THE BOTANICAL EXPEDITION TO NORTHERN CALIFORNIA, UNDER JOHN JEFFREY, IN 1852
RED FIR WOOD IS USED LARGELY FOR ROUGH LUMBER, PACKING BOXES, BRIDGE FLOORS AND MINE TIMBERS BUT ITS GOOD WORKING QUALITIES PROMISE A MORE GENERAL USE

RED FIR

Abies magnifica. Murray

Photograph by Harry H. Haworth

At elevations of 7,000 to 9,000 feet above sea level in Oregon and California, Red Fir develops into a tall symmetrical tree with dark blue-green foliage.

RED FIR, also known as red-barked fir, Shasta fir and golden fir, is found on high mountain slopes and meadows from southern Oregon and northern California southward on the western slopes of the mountains to the divide between the White and Kern Rivers. It grows at elevations from 4,800 to 9,000 feet above sea level, and forms extensive forests in the Sierra Nevada and on Mt. Shasta at altitudes of 7,000 to 9,000 feet where it is associated with western white pine, Douglas fir and Jeffrey pine. Its largest size is attained on moist, sandy or gravelly loam soils, where deep snows frequently cover the ground from November to June but where the temperature seldom falls to zero.

True to its name, *Abies magnifica* becomes a magnificent, symmetrical tree commonly sixty to 125 feet high and occasionally 175 feet high with trunk diameters from one to five feet. The narrowly cone-shaped crown is composed of numerous horizontal strata of fan-shaped sprays. Too little is known regarding the longevity of red fir, but trees are known to have lived 350 to 370 years. The scientific name is credited to the botanical studies and descriptions of Andrew Murray, who as Secretary of the Oregon Botanical Association of Edinburgh, Scotland, sponsored the botanical expedition of John Jeffrey into northern California in 1852. The specimens and field notes of this expedition are in the Herbarium of the Royal Botanical Garden at Edinburgh.

There are some twenty-five species of fir distributed over the northern hemisphere. Eleven of these are native within the United States and seven are peculiar to the western mountain region.

In close stands the trunks of red fir are clear of branches for sixty to eighty feet. The central and lower branches droop, while those near the crown have an upward trend. Only in the densest stands are medium sized trees clear of branches for as much as half of their length.

The deep purplish-brown or dark red bark of mature trees is two or three inches thick, hard, rough, with deep furrows and narrow, rounded ridges which give a peculiar diagonal or zigzag trend. In youth the bark, like that of many larger branches, is relatively smooth and conspicuously chalky-white. As with other true firs, balsam blisters are evident under the thin bark of young trees and branches.

The dark blue-green, four-angled flat leaves have wide blunt ends, are five-eighths of an inch to a little over an inch long without a twist, and are densely incurving so as to hide the upper side of the branch. The leaves frequently have a whitish tinge and the new growth is light green. They are arranged spirally on the branches and persist for five to ten years. Branches from which the leaves have fallen are marked by conspicuous circular scars, where the leaves were once attached. The twigs divide in a horizontal plane, developing numerous fan-shaped sprays of foliage which give the tree an appearance of being stratified. The leaves on the lower branches differ slightly from those in the middle and upper parts of the tree. The light, chocolate-brown leaf buds are sharp-pointed and without resin.

The greenish-red ovulate catkins are about three inches long and stand erect and singly on branches of the uppermost part of the tree. They develop from buds formed during the previous season on twigs of that year, and grow during a single season from dull purple objects to erect deep purple or occasionally brown cones. They are broadly oval, four to eight inches long, two and one-half to three and one-half inches in diameter, with broad scales whose edges are upturned and

partly conceal the irregular tongue-like points of membranous bracts. The dark reddish-purple pollen-bearing flowers hang like long cylindrical cones from the under side of branches of the previous year's growth, and on the same tree with the ovulate catkins. They occur most plentifully in the upper half of the tree, but below the cone-bearing catkins. The cones mature in August of the first year and maintain their erect or nearly erect position, which is characteristic of all firs. They break up during September, liberating numerous seeds with large shiny purple or rose-colored wings. Only an erect spike, or central axis, three to seven inches long is left through the winter. The bald cypress of the South is the only other native cone-bearer whose mature cones break up in a similar manner. Good crops of seeds are produced every two or three years. Seeds may be carried by the wind two hundred feet or more from the parent tree and germinate abundantly on exposed moist mineral soils, or in light shade. Seedlings grow rapidly and frequently cover high slopes or openings cleared by fire or storm. As the tree grows older it is less tolerant of side shade.

The wood has a reddish tinge, is soft, light, rather brittle and with a straight, fine grain. It is more durable in contact with the soil or exposure to the weather than the wood of any of the other native firs. Weighing twenty-nine pounds to the cubic foot when air-dried, it ranks as the heaviest of all firs. No separate estimates exist regarding its commercial stand, but it forms a considerable part of the 131,736,000,000 board feet of standing timber credited to the seven species of western fir, of which 67,253,000 board feet were cut in 1933 as compared with 51,503,000 board feet in 1932. The heaviest production is reported from California and Oregon. It is used largely for rough lumber, packing boxes, bridge floors and mine timbers but as yet has no definite place in the lumber market.

The blisters on the bark are the source of an oleo-resin known as Canada balsam, used for mounting microscopic specimens, for medicinal purposes and in the manufacture of some varnishes. An essential oil used in pharmacy is also obtained from the leaves, which give off a turpentine-like odor when bruised.

The dense foliage and frequent exudation of balsam on the bark make young stands of red fir susceptible to fire, but with increasing age, the thicker bark resists damage from the heat of ground fires. Dense young stands are also seriously weighed down and bent by heavy snow storms.

Small woolly sucking insects known as adelgids sometimes cause extensive injury to the leaves and buds of this and other firs. No satisfactory control measures have been developed for forest trees but soapy solutions containing nicotine are usually effective when sprayed on infested ornamental trees during late winter or early spring.

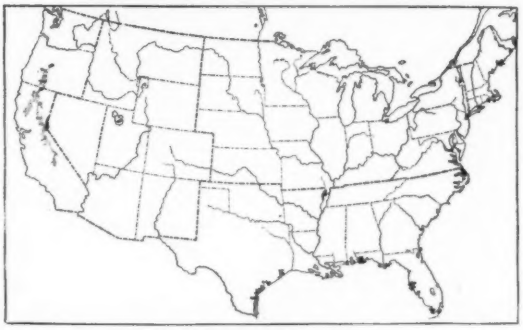
The handsome regular habit of red fir together with its ability when young to grow in crowded shady stands makes it desirable as an ornamental tree. It has proved successful on cool moist sites in the eastern states and in northern Europe but is generally less hardy than Noble fir or some of the local species. The leaves are injured by smoke or other atmospheric impurities, so that this tree is unsuitable for planting in cities or in the vicinity of factories using soft coal.

Photograph by National Park Service

The deep, purple, four to seven-inch cones stand singly and erect on twigs of the previous year's growth.

Photograph by National Park Service

Deep zigzag furrowings in the hard, rough, dark red bark are characteristic of Red Fir.



Natural range of Red Fir.

AROUND THE STATES
WITH
THE AMERICAN FORESTRY ASSOCIATION

President Orders the Civilian Conservation Corps Doubled

Expansion of the Civilian Conservation Corps to a strength of 600,000 men was ordered by President Roosevelt on April 10. Following a conference with Robert Fechner, Director of Emergency Conservation Work, the President announced that 300,000 new men would be enrolled in the Corps within sixty days. Under the terms of the new work relief act, $600,000,000 will be allotted for this increase, it was announced.

The order will bring the number of C.C.C. camps in the country up to 2,916, an increase of 1,740. These new camps will be distributed among the nine Army Corps Areas, with the East, the Middle West and the Lake States receiving the greatest number. Work plans for the new camps were approved by Mr. Fechner a month ago.

Although it is expected that the new camps will be ready for occupancy within sixty days, and that plans for the selection, enrollment and conditioning of the 300,000 new members will be put in motion at once, the first step will be to fill more than 100,000 vacancies in the Corps at the present time. These vacancies, brought about by expiration of terms and discharge of members to accept jobs, have been held open pending passage of the $4,000,000,000 work relief bill. Thus, within sixty days, more than 400,000 new members will be enrolled in the C.C.C.

According to Mr. Fechner, there will be no changes in the administration of the new Corps. The Labor Department will continue to enroll the members, the Army will plan and construct the various camps and, as is the case at present, the officers in charge of the new camps will be selected from the Officers' Reserve Corps.

There are, however, several changes governing the enrollment of members of the Corps. First, the maximum age limit has been increased from twenty-five to twenty-eight years. The minimum age is eighteen. Second, the total period of service of enrolled members will be increased from twelve months to eighteen months. Under this new ruling, thousands of young men, who have been discharged upon completion of twelve months of service, may return for an additional six months.

Following a definite work program formulated by the Departments of Agriculture and Interior and the various states, 605 of the new camps will be assigned to National and State Forests, 334 to projects of the Soil Erosion Service, 161 to state parks, eighty-eight to army and navy projects, forty-three to grazing control work on the Public Domain, thirty-six to projects of the Reclamation Service, of the Department of Interior, seven to National Parks, and two to General Land Office projects.

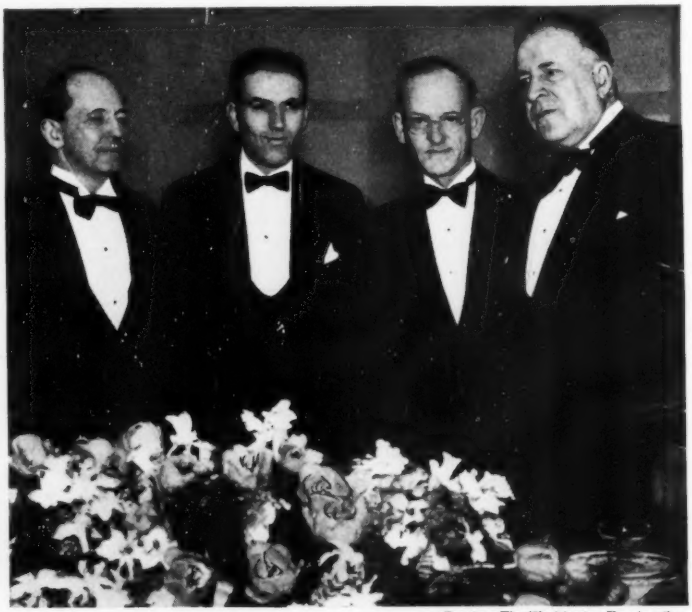
Locations of the new camps, approved by Mr. Fechner and now before the President, are as follows: First Corps Area, including Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island and Vermont, seventy-two, for a total of 178 camps; Second Corps Area, including Delaware, New York and New Jersey, 309, for a total of 406 camps; Third Corps Area, including Pennsylvania, Maryland, Virginia and the District of Columbia, 145, for a total of 322 camps; Fourth Corps Area, including Alabama, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina and Tennessee, 156, for a total of 413 camps; Fifth Corps Area, including Indiana, Kentucky, Ohio and West Virginia, 238, for a total of 355 camps; Sixth Corps Area, including Illinois, Michigan and Wisconsin, 186, for a total of 373 camps; Seventh Corps Area, including Arkansas, Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota and South Dakota, 121, for a total of 369 camps; and Eighth Corps Area, including Arizona, Colorado, New Mexico, Oklahoma and Texas, 123, for a total of 277 camps. No new camps were designated for the Ninth Corps Area, including California, Idaho, Montana, Nevada, Oregon, Utah, Washington and Wyoming. On the contrary, seventy-four of the present camps will be withdrawn and relocated in other regions, leaving but 223 camps in the area.

The C.C.C. will continue under its new strength—600,000 men—until March 31, 1937. Before the Work Relief Act was passed by the House and Senate on April 5, a section was added continuing the Corps for two years. Inclusion and passage of this section makes unnecessary the Walsh-Darden bills, calling for the extension of the C.C.C. for this period.

It was also announced that the $600,000,000 provided for the Corps may be increased by as much as $800,000,000 at the discretion of the President, making a possible total of $1.400,000,000.

The order to double the strength of the Civilian Conservation Corps was issued just five days after President Roosevelt had received Director Fechner's report covering the first two years' operation of the Corps. In his report Mr. Fechner informed the President that the Corps was ready for prompt expansion, and at the same time declared "The C.C.C. had proved so effective as a relief and conservation agency that I recommend it be made a permanent part of the Federal establishment."

The major results achieved by the Corps during its two-year period appear on page 240.



Courtesy The Washington Evening Star

THE AMERICAN FORESTRY ASSOCIATION HONORS ROBERT FECHNER

Robert Fechner, Director of the Civilian Conservation Corps, and his Advisory Council were honored at a testimonial dinner on March 22 by The American Forestry Association in recognition of their public service in directing the C.C.C. through its first two-year period. Above, from left to right, are Henry Solon Graves, President of the Association, who served as Toastmaster, Rexford Guy Tugwell, Undersecretary of Agriculture, Mr. Fechner, and United States Senator David I. Walsh, of Massachusetts, who spoke at the dinner.

FIRST LINE OF DEFENSE in FOREST Brush and Grass FIRE FIGHTING

COMBINATION BRASS NOZZLE FOR 50-FOOT STREAM OR A LONG COARSE SPRAY. NOZZLES CHAINED TO PUMP AND CANNOT BECOME LOST
COMBINATION BRASS HANDLE FOR CARRYING TANK AND FOR HOLDING PUMP
HEAVY BRASS, QUICK OPENING WATER TIGHT FILLER CAP WITH REMOVABLE BRASS STRAINER. CAP HAS INSIDE CHAIN TO PREVENT LOSING.
EXTRA HEAVY TANK HAS SOLID BRASS BOTTOM. ALL JOINTS LOCKED AND SOLDERED. BUILT STRONG

FORM-FITTING, VENTILATED TANK GIVES A CONSTANT CIRCULATION OF AIR BETWEEN TANK AND CARRIER'S BACK. IT PROTECTS THE BACK FROM THE COLD WATER AND MOISTURE IN THE TANK AND KEEPS THE BACK WARM AND DRY. THE FORM-FITTING SHAPE OF THIS TANK FITS THE BACK PERFECTLY. SNUG AND FIRM AND FEELS GOOD.

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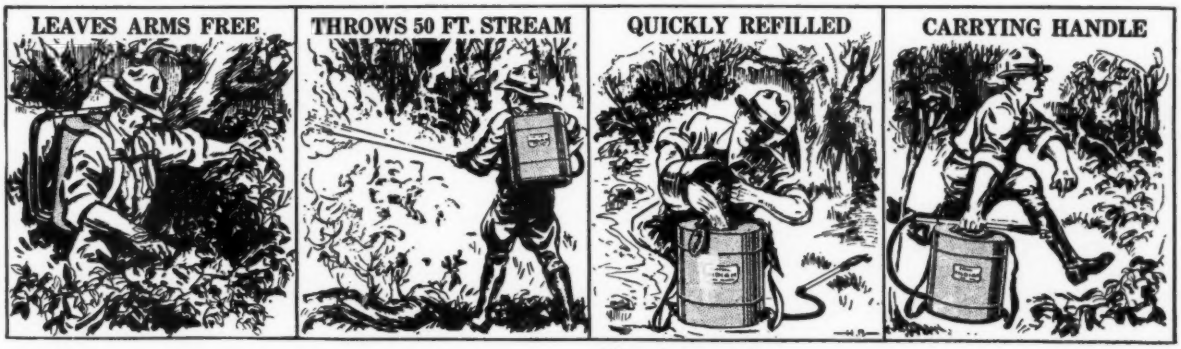

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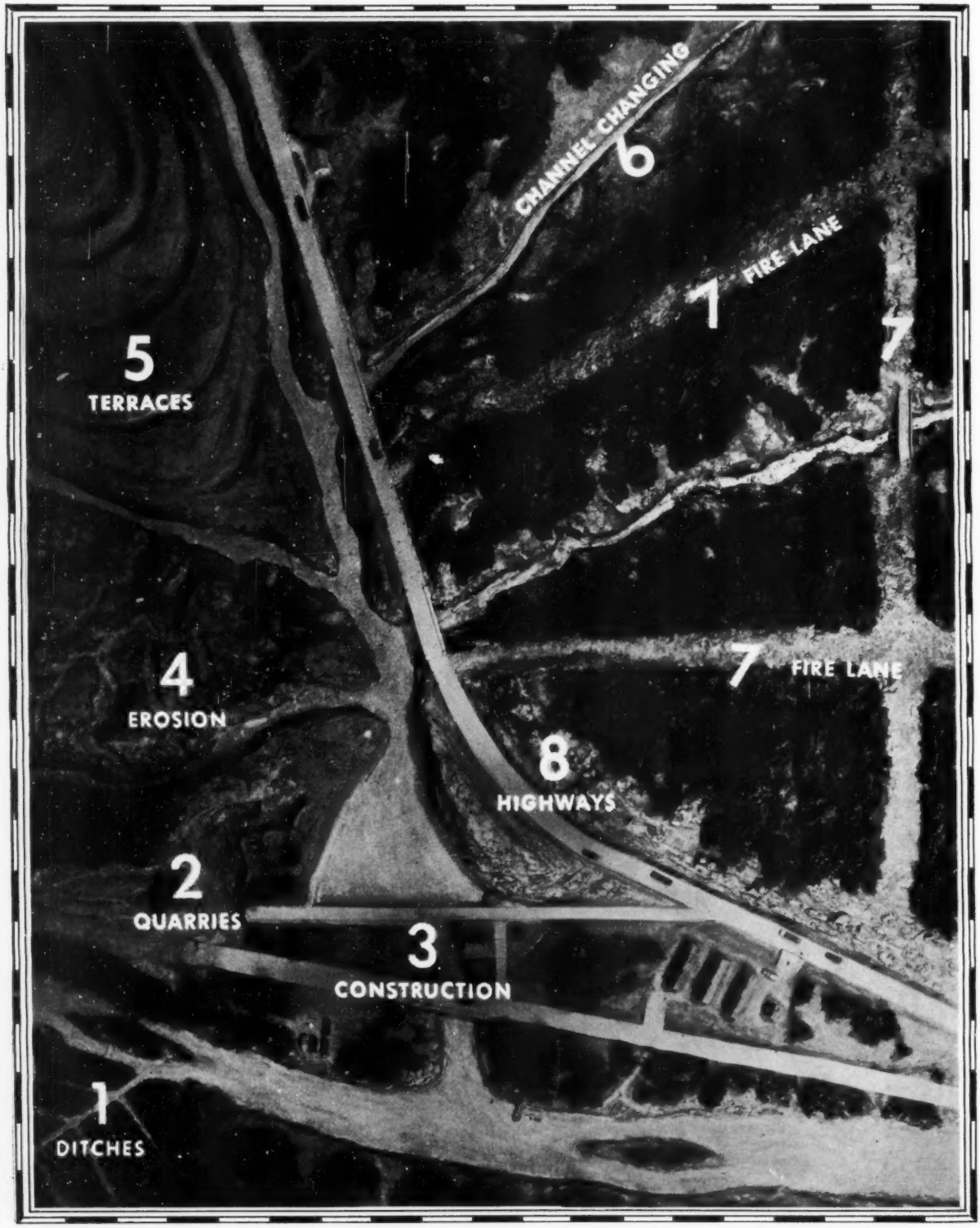
HOW DYNAMITE



SERVES THE NATION

FOR YEARS the mighty power of dynamite has been used to drive tunnels through the rocky hearts of mountains, to strip away the overburden from rich deposits of coal and ore, to bring down rock from the giant faces of quarries, to deepen harbors and channels, to be the aid of industry in countless different ways.

Now comes Uncle Sam to use dynamite as *his* servant—to aid his many workers on his vast projects of construction and reclamation ... to help build highways ... to control floods ... to curb soil erosion ... to clear fire lanes through forests.

These and other uses are pictured on the opposite page and described below.

Du Pont engineers have collaborated with the government in working out explosive methods for all the great operations now under way. Write for descriptive booklets.

Description

OF DIORAMA

(on opposite page)

1 Ditches are blasted with DYNAMITE to drain mosquito-breeding swamps

2 Rock BLASTED from quarries is used for dam and highway construction

3 DYNAMITE is used to blast channels in bed-rock to anchor flood control dams

4 Gully erosion is stopped by building temporary dams ... BLASTING soil into gully bottoms...and planting trees in blasted soil

5 Broad terraces check farm-land erosion. Stumps and boulders must be BLASTED from terrace lines

6 A crooked stream causes flooding and erosion. DYNAMITE is used to straighten the channel

7 EXPLOSIVES assist in clearing, building and maintaining fire lanes so essential to forest preservation

8 Rock cuts are BLASTED along scenic highways to ensure easy grades and a safer alignment

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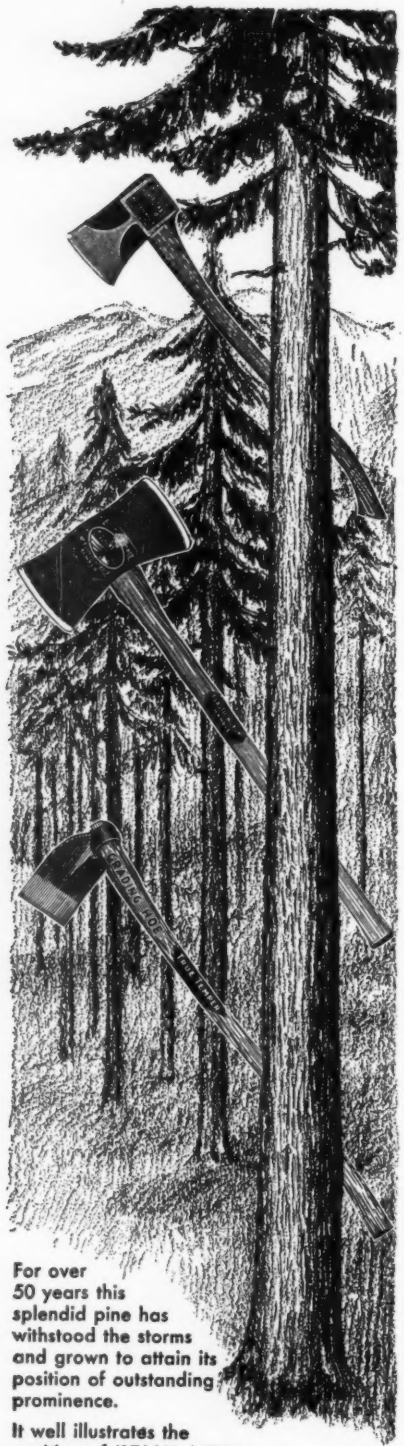

For over 50 years this splendid pine has withstood the storms and grown to attain its position of outstanding prominence.

It well illustrates the position of *KELLY AXES* . . .

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CLOSED HUNTING SEASON ADVOCATED FOR WATERFOWL

Declaring that on the basis of information now available the shortage of migratory waterfowl has become so critical that stringent measures must be taken to build up and maintain an adequate breeding stock, the Board of Directors of The American Forestry Association, meeting in Washington, D. C., on March 21, passed a resolution advocating closing the hunting season for one or more years as conditions may demand. In addition to a closed season, the Association urges adequate federal appropriations and cooperation by the various state game departments and sportsmen in general to enforce all regulations that may be necessary to meet the critical emergency now existing. The full resolution passed by the Board reads as follows:

"WHEREAS, a serious emergency exists which threatens the preservation of migratory waterfowl, and

"WHEREAS, this emergency has been brought about by a combination of factors among which the most important immediately controllable one is that of killing by man, and

"WHEREAS, an increase of the supply of migratory waterfowl to numbers adequate to assure their perpetuation and to preserve the sport of duck hunting calls for an aggressive and fearless program of restoration, and

"WHEREAS, such a program can be successful only by rigid application and enforcement of necessary measures to protect and increase the remaining supply.

"NOW, THEREFORE, BE IT RESOLVED That the Board of Directors of The American Forestry Association, meeting in Washington, on March 22, 1935, believes that on the basis of present information this emergency is so grave as to warrant the following measures by the Federal Government:

"1. Prohibition of all hunting of migratory waterfowl for one or more seasons as may be necessary to build up an adequate breeding stock.

"2. Provision of adequate funds by the Federal Government and the fullest cooperation by the state game departments and by sportsmen to enforce a closed season and all regulations that may be necessary to meet the emergency.

"3. Allocation of funds to permit the Biological Survey to complete as rapidly as possible its acquisition program of migratory wildlife refuges and their proper development as resting and propagating areas."

A. F. A. ENDORSES STATE FORESTS MEASURE

At its regularly quarterly meeting held in Washington, D. C., March 22, the Board of Directors of The American Forestry Association endorsed legislation to provide federal aid to the states in the acquisition, development and administration of State Forests. A measure to this effect is now pending in Congress in the form of H. R. 6914, introduced by Congressman Fulmer of South Carolina on March 21. The Directors of the Association passed a resolution endorsing this bill, declaring that it is important that the development of National and State Forests be closely coordinated and that the extension of State Forests is desirable to encourage and strengthen the work of state forestry.

The Fulmer bill, if passed, would provide machinery whereby the Federal Government could purchase forest lands suitable for State Forests, turn them over to the states for administration and be reimbursed the original cost of the lands from proceeds derived from the state administered forests. The bill authorizes the Secretary of Agriculture to enter into cooperative agreements with such states as in his judgment are adequately prepared to administer, develop and manage as State Forests such lands as the United States may purchase for that purpose. In entering into such cooperative agreements, the state would be required before June 30, 1942, to provide by law for the reversion of title to the State or political unit thereof of tax delinquent lands which are more suitable for public forests than for private ownership.

In order to qualify for cooperation, a state would be required to provide for the employment of a professionally trained state forester of recognized standing and a state forest organization in which the personnel is technically qualified, employed, advanced and retained upon the basis of merit.

Another section of the bill provides that the Secretary of Agriculture and authorized representatives of the state shall work out joint plans for defining state forest areas under the act. Purchase of lands would be subject to approval by the National Forest Reservation Commission. Standards of forest administration, development and management as carried out by the states would have to be acceptable to the Secretary of Agriculture.

The amount authorized by the bill for the purchase of lands to be turned over to the states for administration as State Forests is $20,000,000. The Government would be reimbursed for this advance expenditure through a provision of the bill which requires that one-half of the gross proceeds derived from the State Forests shall be covered into the United States Treasury and credited to the purchase price the state is to pay the United States for the lands involved. The Federal Government would retain title to all lands thus purchased until the full purchase price has been discharged by the state.

A final provision of the bill authorizes the Secretary of Agriculture on behalf of the Federal Government to contribute annually out of any funds made available under the act not to exceed one-half the cost of administering, developing and managing tax delinquent forest lands which the state, without cost to the United States, includes within a state or other public forest.

The Directors of the Association at the same meeting passed a resolution calling attention to the confusion now resulting from the large number of federal agencies engaged in the purchase of lands and the need of coordinating the work. To this end, the resolution approves the recommendations of the National Resources Board for the working out of a plan to coordinate the purchase and disposition of lands to the end that they may yield their maximum benefits to the states and to the general public.

U. S. Acquires Battell Forest

Battell Forest, bequeathed to Middlebury College in 1916 and embracing within its thirty thousand acres some of the finest virgin timber in Vermont, will shortly pass into the hands of the United States Government. Its purchase was approved by the National Forest Reservation Commission on March 25. The government purchase includes all of the area with the exception of about six thousand acres known as Battell Park. Under the will of Joseph Battell, who bequeathed the area to the college, the portion designated as Battell Park must be preserved in its virgin and primeval state. The college will, therefore, retain this portion of the tract which embraces a region of great natural beauty and interest, including Lake Pleiad near the crest of the Green Mountain range.

Approval of the purchase of the remainder of the tract is the result of several years negotiations between the college and the government. The college authorities, it is understood, have been desirous of disposing of the forest in order to provide funds for the expansion of college buildings pressingly needed. The price at which the Government will take over the tract is $20 an acre, or $442,800 for the 22,140 acres. A government cruise of the area purchased, it is declared, shows the tract to average between six and seven thousand feet of timber to the acre.

At the same meeting the National Forest Reservation Commission approved for purchase two additional tracts of land in the Green Mountains to the south of Battell Forest. The two areas aggregate 26,000 acres. Plans of the Forest Service contemplate establishment of a northern extension of the Green Mountain National Forest to embrace these two areas and Battell Forest.

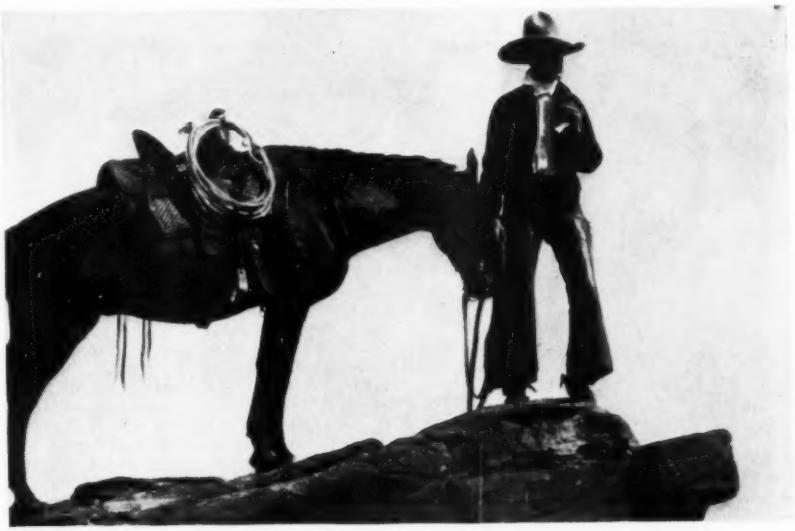
Ickes Would Keep Parks Natural

In the course of his recent address welcoming a convention of C.C.C. workers in State Parks under National Park Service auspices, Secretary of the Interior, Harold L. Ickes, said:

"I am tremendously interested in parks, particularly in those sections of them which are wilderness. I think we ought to keep as much wilderness area in this country of ours as we can * * *

"I am not in favor of building any more roads in the National Parks than we have to build. I am not in favor of doing anything along the line of so-called improvements that we do not have to do. This is an automobile age, but I do not have a great deal of patience with people whose idea of enjoying nature is dashing along a hard road at fifty or sixty miles an hour. I am not willing that our beautiful areas should be opened up to people who are either too old to walk, as I am, or too lazy to walk, as a great many young people are who ought to be ashamed of themselves. I do not happen to favor the scarring of a wonderful mountain side just so that we can say we have a skyline drive. It sounds poetical, but it may be an atrocity * * *

"I would not agree to put a lake in a wilderness area where there should not be a lake, merely to have a lake. An artificial lake is not a lake, after all. It is all right in a State park. But that is a different sort of thing. It is out of place in a wilderness area. So long as I am Secretary of the Interior and have anything to say about the parks, I am going to use all the influence I have to keep parks as far as possible in their natural state."



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FOREST LAND PURCHASE POLICY APPROVED

Final authorization for the purchase of 8,426,006 acres and the expenditure of $30,000,000 allocated for forest land purchases since the beginning of the present administration, was completed by the National Forest Reservation Commission at two meetings held on March 25 and March 30. These purchases were authorized under the Emergency Conservation Work program to provide work for the Civilian Conservation Corps and had to be approved before the expiration of the original act on March 31.

At the meeting of March 25 the Commission discussed the program of acquiring large tracts of merchantable timber or advanced second growth, suitable for permanent forest management by private industry. The Commission declared that while it is not its policy to attempt to buy all heavily timbered lands it will continue to consider the purchase of those timbered lands which can be secured economically and where their administration by the United States Forest Service will help develop the process of sustained yield. It will also purchase forest lands, whose administration by the Federal Government, in the opinion of the Commission, would stabilize the life of communities and industries dependent upon the National Forests.

The Commission was of the opinion that the purchases made during the past few years have in no way resulted in placing federally owned forests in competition with forests in private ownership and that it has no desire to acquire forest land whose withdrawal from private ownership would in any way jeopardize the administration of the land or its neighboring holdings for private purposes.

In completing the program on March 30, the Commission approved purchases totalling 280,619 acres at an aggregate cost of $923,050. These included 5,196 acres in New England, 28,755 in the Appalachians, 93,384 acres in the Southern Pine Region, 16,677 acres in the Ozarks and the Central Mississippi Region, and 128,854 acres in the Lake States and Upper Mississippi States.

Expansion of the Lake Gogebic and Ottawa National Forest area in the northern peninsula of Michigan is expected to aid in bringing the area under management on a sustained yield basis and to help maintain community stability and employment.

New purchase units were established in Indiana, and 82,739 acres were approved for purchase in the Talladega Nationl Forest Purchase Unit, in Alabama.

The 8,426,006 acres approved for purchase since June 9, 1933, involve the expenditure of $25,325,261, or an average cost of $3.05 an acre.

SOIL EROSION SERVICE TRANSFERRED

Announcement of the transfer of the Soil Erosion Service from the Department of the Interior to the Department of Agriculture, by mutual agreement on the part of Secretaries Harold L. Ickes and Henry A. Wallace, was made on March 22 when the remainder of the $20,000,000 of Public Works funds allotted for erosion control was placed with the Department of Agriculture. The Soil Erosion Service will continue under the direction of Dr. H. H. Bennett and all erosion control services in the Department of Agriculture, with the exception of those in the Forest Service, have been placed under the Service. Those of the Forest Service will be coordinated with the regular Soil Erosion Control activities as will similar activities now being administered by the National Park Service, the Bureau of Indian Affairs and the Reclamation Service. Detailed plans for administration are now being studied by a committee appointed by the Secretary of Agriculture.

LUMBER CODE CONTINUES

The Code of the Lumber and Timber Products Industry will be continued on a voluntary basis awaiting clarification of the constitutional status of sections of the National Recovery Act, or until new legislation extending the National Industrial Recovery Administration is passed by Congress, according to an announcement of the Board on April 9. The use of the Blue Eagle or similar labels will be confined to those mills whose products are produced in accordance with the wages and hours and other provisions of the code.

Government contracts will only be awarded upon the basis of voluntary compliance with the code provisions, but no compulsory enforcement of the code will be attempted with regard to products entering the other channels of trade. Meanwhile, administrative machinery will be set up within the N.R.A. designed to afford authoritative, prompt and efficient attention to lumber code matters and joint efforts will be made to develop improved means of obtaining compliance within the industry.

In view of the importance of continuation by the lumber industry of the systematic and determined effort to effectuate forest conservation as set forth in Article X, Executive Secretary Franklin Reed, of the Society of American Foresters, wrote Dr. Wilson Compton, Secretary-Manager of the National Lumber Manufacturers Association, that "the Society feels most strongly" that the recent decision "should not be allowed to interrupt the progress of forestry."

The decision to continue the lumber code followed nearly two weeks of discussion by representatives of the Lumber Code Authority, the National Industrial Recovery Board and others, following the announcement of March 25 that the Department of Justice had voluntarily withdrawn its case against William E. Belcher, an Alabama mill owner, charged with violation of wage and hour provisions of the lumber code.

Without denying the payment of less than full wages on working his men longer than code hours, Mr. Belcher based his opposition on the questionable constitutionality of the N.R.A. legislation. In October, 1934, Judge William I. Grubb, of the northern district of Alabama, sustained Mr. Belcher, holding the provisions of the National Recovery Act to be in violation of the commerce clause of the constitution in that it deprived one of his property without due process of law; that it was an unlawful delegation of power by Congress and that it violated constitutional guarantees concerning the right to a speedy trial against and excessive fines and the infliction of cruel and unusual punishment.

Until the constitutionality of existing or proposed legislation is determined, the ability of the Department of Justice to enforce the lumber code becomes a matter of conjecture. Accordingly, on March 27, the resident committee of the Lumber Code Authority in Washington telegraphed its administrative divisions throughout the country requesting suspension of the lumber code. Under the more recent decision it is expected that a skeleton organization will be held together.

Oregon Outlines Forestry Program

A six-point forestry program has been presented to the Oregon State Legislature by Governor Martin as "absolutely essential to the permanent prosperity of the State of Oregon."

Briefly, the program calls for a deferred timber tax plan, which in reality is a provision for Federal credit to non-operating timberland owners; a provision for official state recognition of forest properties managed for sustained yield production; a proposal for State authority for Federal acquisition, whereby the State would authorize the Federal Government to acquire such forest land as could not remain in private ownership; a proposal for forest zoning, the purpose of which is to discourage isolated agricultural or attempted agricultural development of lands primarily suited for forest crop production; a provision for carrying out the agreement between the President and the governor of Oregon at the time the Civilian Conservation Corps was established; and certain proposals which will make possible the acquisition by the State or Federal Government of county-owned forest lands.

Pine Named Georgia State Tree

The pine tree has been named the official tree of the State of Georgia and the brown thrasher the official bird by recent action of the General Assembly. This followed the receipt of petitions filed by thousands of school children sponsored by the Garden Clubs of Georgia. No species of pine is designated under the bill but in all probability it would be either longleaf pine or shortleaf pine.

Ohio Tries Game Experiment

The Ohio Division of Conservation has announced plans to develop a controlled shooting program on an experimental basis in Union, Madison and Trumbull counties, somewhat similar to the program now in vogue in Iowa.

Sportsmen's organizations as well as farm groups have advocated a plan whereby game would become an asset to Ohio farms rather than a liability, it was stated. The plan provides for payment to farmers of a small hunting privilege fee from each hunter who comes to the area and also a charge per head for each bird or animal taken. A controlled shooting association would be formed among farmers in the township under this plan, with an executive committee as a governing board.

The purpose of the plan is to keep the cost of hunting on such controlled shooting areas so low that it would be within the reach of almost anyone, and at the same time remunerate the farmer for his cooperation in raising a game crop.

ENGINEERING—ART—AND ATLAS ON NATIONAL PARK HIGHWAYS

Roads in National Parks are highways which blend with and enhance nature's beauty. Unsightly grades, cuts or embankments are not permitted. Rock fragments must not be thrown or scattered.

Control in every phase of such a highway building project is essential. But in those jobs requiring explosives the control of blasting operations is doubly important.

A project which exemplifies such control, in building a great highway which blends with nature, is now being carried on under the direction of J. L. Humbard, Senior Construction Engineer, in the Great Smoky Mountains National Park. In this, as in many other noteworthy road-building jobs, Atlas Explosives have demonstrated the incalculable value of controlled force.

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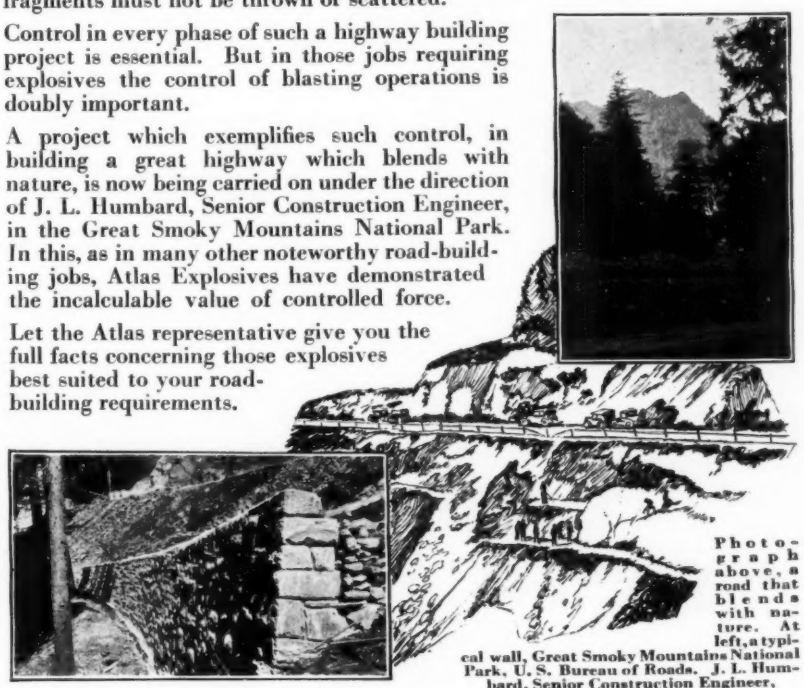

Photograph above, a road that blends with nature. At left, a typical wall, Great Smoky Mountains National Park, U. S. Bureau of Roads. J. L. Humbard, Senior Construction Engineer, Gatlenburg, Tenn.

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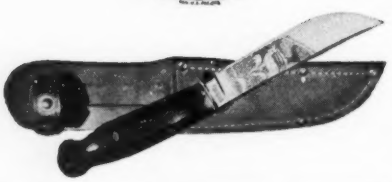

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FECHNER RECOMMENDS PERMANENT C.C.C. IN REPORT

Recommending that the Civilian Conservation Corps be given a permanent place in the Federal Government, Robert Fechner, director of Emergency Conservation Work, on April 5 submitted to President Roosevelt a report covering the first two years' operation of the Corps.

"The C.C.C. has proved so effective as a relief and conservation agency that I recommend it be made a permanent part of the Federal establishment," Mr. Fechner said. He cited that the Corps, in addition to giving the American people a new method to use in combating unemployment and depression, had demonstrated that large numbers of unskilled young men can be put to work on constructive conservation projects that are productive of lasting benefits to the economic and social life of the nation.

Summed up briefly, the Civilian Conservation Corps, according to the report, supplied work for more than 1,000,000 men during its first two years. Not less than 3,000,000 dependents of the enrollees were benefited through participation in the cash allowances earned by the men. Forestry and conservation development in the country was advanced from ten to twenty years, with a valuation on the work accomplished placed at $335,000,000. The cost of maintaining the Corps for the two-year period was $651,087,085.

More than a hundred types of forestry and conservation work were performed. These include operations which have to do with forest culture and protection, flood control, irrigation and drainage, landscape and recreation, wildlife and range conservation, soil erosion control and others.

As of January 31, Mr. Fechner reported, the C.C.C. had constructed 34,714 miles of forest fire control zones, or breaks, and had put in 1,697,555 man-days fighting fire. In addition, fire hazards were reduced on 1,038,373 acres. On other major forest protection projects, 29,787 miles of new telephone lines were strung, 43,234 miles maintained; 48,178 miles of roads and truck trails were constructed, 76,157 miles maintained; and 28,248 miles of roadside and trailside were cleared as a fire protection measure.

Forest stand improvement was reported on 1,643,575 acres; tree and plant disease control on 3,719,383 acres; insect pest control on 4,305,949 acres; and rodent control on 10,768,204 acres. The Corps planted 266,467,000 trees on reforestation projects; built 1,025,741 soil erosion control check dams, 1,148 recreational dams; constructed 3,148 ponds for fish and birds, and 2,438 reservoirs for livestock and wildlife. Public camp grounds developed totaled 36,138, while 2,383 public camp ground buildings were constructed.

Of the 1,070,000 men who have been enrolled in the Civilian Conservation Corps through April 1, about 940,000 have been young men between the ages of eighteen and twenty-five, war veterans and locally enrolled experienced men. Approximately 32,000 Indians and 8,000 territorial enrollees have been in the Corps. More than 90,000 additional men have been employed as reserve officers, forestry supervisors and other technical personnel, educational advisers, carpenters and other skilled workmen.

TO ORGANIZE WILDERNESS SOCIETY

For the purpose of "fighting off" invasions of the remaining wilderness areas in America and to stimulate public appreciation of the "emotional, intellectual and scientific values" of the primitive, announcement has been made of the organization, in Washington, D. C., of the Wilderness Society.

In its platform the Society presents the wilderness as a "natural mental resource having the same basic relation to man's ultimate thought and culture as coal, timber, and other physical resources have to his material needs." The use of this resource should be considered a public utility and therefore its commercialization should not be tolerated, it maintains.

It points out that scenery and solitude are intrinsically separate things, that the motorist is entitled to his full share of scenery, but that motorways and solitude together constitute a contradiction; that outing areas in which people may enjoy the non-primitive forest are highly desirable for many pent-up city people who have no desire for solitude, but that such areas should not be confused in mental conception or administration with those reserved for the wilderness. It further states that, since primeval succession can never return once continuity has been severed, it is manifestly the duty of this generation to preserve under scientific care, for the observation, study, and appreciation of generations to come, as many, as large, and as varied examples of the remaining primitive as possible; that the wilderness remaining in America has shrunk to such a small remnant of the country's total territory, that what area does remain is all-precious and its preservation constitutes a vital necessity. Also "that encroachment upon our remnant American wilderness in any one locality is an attack upon the whole and creates therefore an issue of national moment and not one for local action alone," and that "since the invasion of wilderness areas is generally boosted by powerful, country-wide organizations, it is essential that individuals and groups who desire to preserve the wilderness must unite in a country-wide movement in its defense."

The organizers specifically define the types of wilderness the Society will fight to preserve. They are: Extensive wilderness areas which possess no means of mechanical conveyance and which are sufficiently spacious that a person may spend at least a week of travel in them without crossing his own tracks; primative areas, or virgin tracts, in which human activities have never modified the normal processes of nature; superlative scenic areas so surpassing and stupendous in their beauty as to affect almost everyone who sees them; restricted wild areas in regions of concentrated population which, even though not having great size, virgin conditions, or superlative scenery, are at least free from sights and sounds of mechanization; and finally, wilderness zones, strips along the backbone of mountains and rivers which, although they may be crossed by railroads and highways, nevertheless maintain primitive conditions.

The common types of wilderness invasion were announced as roads and motor vehicles, radios, railroads, cog roads, cableways, graded trails, ski trails, foot bridges, logging operations, power lines, water-power developments and irrigation projects, airplanes, telephones, beacon towers, fences, sheep and cattle grazing, and cabins and shelters.

The organizing committee of the Wilderness Society is as follows: Robert Sterling Yard, secretary, National Parks Association; Aldo Leopold, in charge of Game Research, University of Wisconsin; Robert Marshall, forester, United States Indian Service; Benton Mackaye, regional planner, Tennessee Valley Authority; Ernest C. Oberholtzer, secretary, Quetico-Superior Council; Harold C. Anderson, planner, Appalachian Trails; Harvey Broome, of Knoxville, Tennessee, and Bernard Frank, assistant forester, Tennessee Valley Authority.

FECHNER AND COUNCIL HONORED BY THE AMERICAN FORESTRY ASSOCIATION

Robert Fechner, Director of Emergency Conservation Work, and his Advisory Council were honored at a testimonial dinner on March 22 by The American Forestry Association in recognition of their public service in directing the Civilian Conservation Corps through its first two-year period which ended March 31.

President Roosevelt, although unable to attend, led the four hundred or more conservationists and government officials in honoring the second anniversary of the Corps and its director. In a message read by Henry Solon Graves, president of the Association, who served as toastmaster, the President declared that the accomplishments of the C.C.C. had been a source of great gratification and expressed an "earnest hope" that the work it is doing "will find a permanent place in our government."

Joining the President in commending the record of the C.C.C. were Rexford Guy Tugwell, Undersecretary of Agriculture, and Senator David I. Walsh, of Massachusetts, author of the Act creating the Corps.

"The splendid work accomplished by the Civilian Conservation Corps during the two years it has been in operation has been a source of greatest gratification to me," the President declared. "The result achieved in the rehabilitation of youth, the conservation of our natural resources, the development of new recreational opportunities for our citizens, and the quickening of business recovery have proved so worthwhile that I have not hesitated to recommend the continuance of the C.C.C. for another two years.

"It is my earnest hope that the work carried on by the Civilian Conservation Corps will find a permanent place in our government. Only in that way can the nation, through future generations, enjoy the full benefits of what already has been accomplished and the full measures of all that ultimately will be achieved."

Both Undersecretary Tugwell and Senator Walsh paid stirring tributes to the Corps, its director, and his council, which includes F. A. Silcox, chief, United States Forest Service; Colonel Duncan K. Major, of the Army General Staff; W. Frank Persons, director, United States Employment Bureau, of the Department of Labor; and Arno B. Cammerer, director, National Park Service.

Both speakers emphasized the social and spiritual benefits of the Corps to the youth of America, and of the conservation work it has accomplished to the future and welfare of the nation. Mr. Tugwell also declared that the success of the C.C.C. offered an outstanding example of interdepartmental cooperation, referring to the coordinated efforts of the Departments of Labor, War, Agriculture and Interior. Senator Walsh predicted that the nation will be repaid doubly for its investment in building man power and protecting and developing its natural resources through the medium of the C.C.C.

In their tributes to the success of the Corps, the speakers paid special tribute to the late R. Y. Stuart, former chief of the Forest Service. To him, more than any one else, said Mr. Tugwell, "goes the credit of planning the work program of this greatest conservation effort in the history of the nation."

In answer to the honor bestowed upon him, Mr. Fechner modestly gave credit of the success of the Corps to "the President, the members of my advisory council, and to the enrolled members themselves." He pointed out that there was hardly a locality in the country which desired a camp when the C.C.C. was first announced. "But now," he declared, "the behavior and record of these boys have reversed this situation. There is hardly a locality today which does not ask for camps—and more camps." Mr. Fechner also expressed his belief that there was an increasing need for a permanent C.C.C., in some form, if not the present one.

One of the outstanding features of the dinner was the first showing of the Army's new sound film depicting the history of the Civilian Conservation Corps. Musical features, both vocal and instrumental, were contributed by C.C.C. enrolled members from camps in the District of Columbia, Maryland and Virginia, who came to "serenade their Chief."

WHITE BIRCHES

Trooping o'er the hillsides
  Slender, fair, and tall,
Birches in the springtime;
  Wood nymphs each, and all.

Shimmering in the sunlight
  'Neath their gauzy veils,
Lithe forms now are swaying
  In the vernal gales.

Stately stand the maples
  Blushing, and apart
From their white limbed sisters;
  Dryads of my heart.

Leafy screens of summer
  Fair nymphs ne'er conceal;
Stream, or lake's clear mirror
  Beauty doth reveal.

Brown and gold the mantle
  Autumn casts o'er thee,
Dropping it so gently
  Each pure limb is free.

E'er the snow wraiths gather
  Specters, stark and white,
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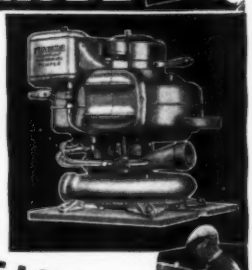
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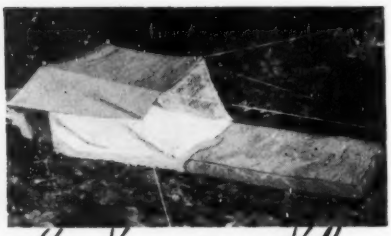

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Foresters Reassigned

At the time of going to press, a number of important changes, transfers and reassignments among federal and state foresters had been announced.

In West Virginia, H. W. Shawhan, formerly state forester, has been named director of conservation, while D. B. Griffin, formerly extension forester, was appointed state forester.

The United States Forest Service announced that C. L. Forsling, at present director of the Intermountain Forest and Range Experiment Station at Ogden, Utah, will become director of the Appalachian Forest Experiment Station at Asheville, North Carolina. E. H. Frothingham, director of the Appalachian Station, will concentrate his efforts on silvicultural research. Professor Reed W. Bailey, of the Utah State Agricultural College at Logan, and who for the past year has been serving as conservationist at the Intermountain Station, will become director of the station.

In the National Forests of California, G. M. Gowen, supervisor of the Lassen Forest, has been transferred to the office of the chief forester, at Washington, and F. P. Cronemiller, supervisor of the Modoc National Forest, was transferred to the regional forester's office, at San Francisco.

F. J. Jefferson, in charge of fire control at Missoula, Montana, has been transferred to the regional forester's office at San Francisco. W. T. Murphy has been promoted to supervisor of the Huron Forest, in Michigan.

C.C.C. Student Enrollment

Students of forestry, landscape architecture, agronomy, irrigation engineering, natural sciences and archeology to the number of 1,400 may be given opportunity for temporary enrollment during the summer in the 2,916 camps planned under the expanded program of the Civilian Conservation Corps.

On the assumption that 1,607 of the camps will be on National Forests, 600 in National Parks and state parks, 549 on soil erosion projects, with the remainder under administration of the Reclamation Service, Office of Grazing Administration, the Land Office and the Army and Navy, it is expected that over 700 students of forestry and other subjects will find employment on National Forests, nearly 300 in National Parks, a similar number on soil erosion projects and the remainder on work administered by the other agencies.

Under a similar plan in effect during the past summer, nearly 600 students were offered temporary employment as enrolled men in the Corps. They received the regular $30 a month but without the requirement that $25 be allotted to their parents or dependents. Full allowance is granted students to help them in continuing their college work.

During the summer of 1935 preference will be given to students who have had two or more years in college, but freshmen whose ability and purpose is recognized by the dean or administrative officer of the college may be given opportunities for employment.

BEHIND THE "MIKE"

Harvey Hays, Judith Lowry and Arthur Jacobson, veteran Chicago N. B. C. dramatic actors, caught by the camera as they broadcast an episode of "Uncle Sam's Forest Rangers" in the National Farm and Home Hour. Each Friday they take their listeners to the mythical Pine Cone Ranger District to give them an interesting and accurate picture of the work of the United States Forest Service in National Forests of the country. The three shown above have been principals since the sketch first was presented three years ago.

700,000 Acres Acquired for Waterfowl Refuges

Acquisition of land for seventeen of the twenty-seven migratory waterfowl refuges being established by the Bureau of Biological Survey and the Federal Emergency Relief Administration, was reported on April 15. All but three of these areas are situated in the primary nesting areas of migratory waterfowl. The remaining ten areas have been partially acquired, it was stated, either by purchase or condemnation.

With the purchase of the seventeen refuges, more than 700,000 acres will have been added to the migratory waterfowl refuges in the United States, at a cost of $6,770,000.

The largest acquisition so far has been the Blitzen Valley Refuge, in Oregon, also known as the Lake Malheur Refuge. This area embraces more than 65,000 acres. The White River Refuge, in Arkansas, is the second largest, with 54,000 acres, and the Lake Mallamuskeet Refuge, in North Carolina, is third, with 50,000 acres. Other areas which have been acquired in full, are in Michigan, North Dakota, South Dakota, Minnesota, and Montana.

After purchase of these lands has been effected, the Biological Survey will undertake extensive development of the areas to provide the fullest utilization of the opportunities offered for game protection.

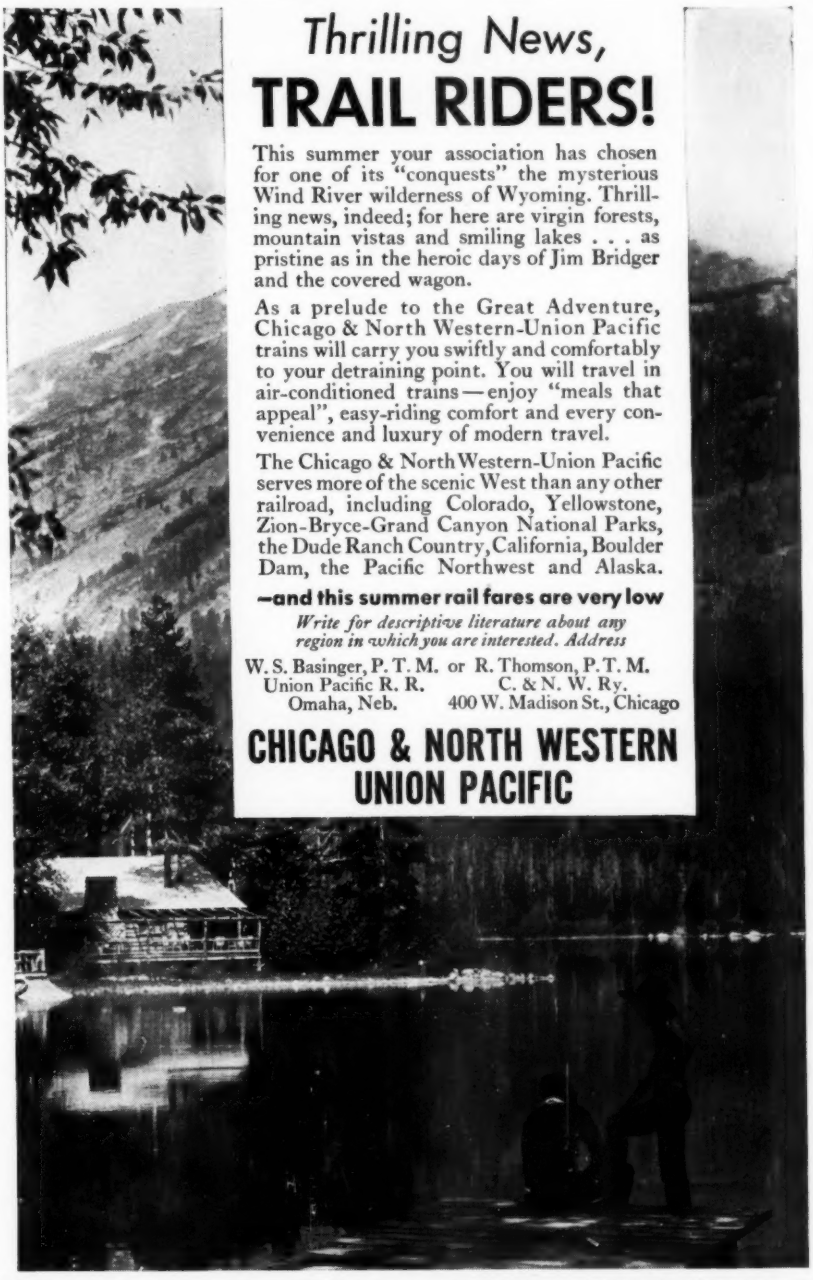
Federal Aid for State Forests Considered by Committee

Characterizing the Fulmer Bill, H. R. 6914, to authorize the Federal Government to aid the States in acquiring land for State Forests, as a constructive move promising to extend forestry into areas reached only under the cooperative fire protection clause of the Clarke-McNary Law, Chief Forester Silcox expressed the unqualified endorsement of the Department of Agriculture and the Forest Service at hearings on April 12 before a sub-committee of the House Committee on Agriculture to which it was referred.

The Chief Forester expressed the opinion that the Federal Government should not attempt to handle the entire forest problem, but should share responsibility with the states, making every effort to maintain self-supporting communities within the forest regions. Providing as it does for the operation of state forests on a merit basis, he said the bill offers a democratic way for strengthening the state forestry organizations. At the same time Mr. Silcox gave assurance that the bill adequately safeguards the rights of the states and of the national government so that under the contemplated management the lands will pay for themselves.

Harry Lee Baker, State Forester of Florida, and President of the Association of State Foresters, said that under this bill the states will have an opportunity to redeem their responsibility to state forestry and establish demonstrations in forest management and fire protection. Representatives Hampton P. Fulmer, of South Carolina, sponsor of the bill in the House, expressed the hope that the authorized appropriation of $20,000,000 can be secured from appropriations in the Work Relief Act and that purchases may begin shortly after the bill is enacted.

The bill is understood to have been approved by Undersecretary Tugwell on April 11, but was referred to the office of the Comptroller General before being dispatched to the House Committee on Agriculture. Meanwhile, hearings will be continued at a later date when various Congressmen will be heard. Thereafter, the full Committee on Agriculture, of which Representative Marvin Jones, of Texas, is Chairman, will study the bill preparatory to a report to Congress.



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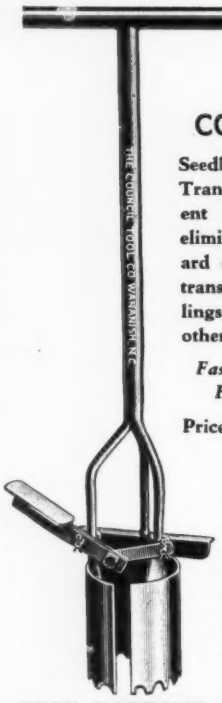

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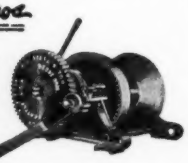

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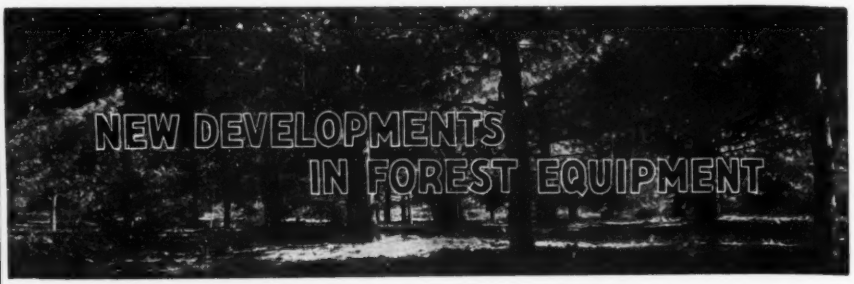


Radio Equipment

Short wave radio equipment is being constantly developed and improved by the United States Forest Service. As now used on the National Forests, equipment consists of various types of sets, including the following:

TYPE P RADIO UNIT. For transmitting code only, but equipped to receive both voice and code, weighing about nine pounds and having a working range of twenty miles. This set was primarily designed for smokechaser use in extremely rugged country where the last word in portability is essential. Because the set does not transmit voice it has a limited use.

TYPE PF RADIOPHONE. Transmits both voice and code. Weighs about fifteen pounds with a working range of ten miles on voice and twenty miles when code is used. More of these sets are in operation than any other, the set being designed primarily for use by smokechasers where reasonably compact and portable voice communication is required.

PF KITBOX. A small chest containing heavier duty batteries than are regularly furnished with the PF Radiophone and a half-wave antenna for semi-permanent installation. The Kitbox was primarily designed to serve secondary lookouts, small fire crews and small construction or maintenance crews.

SSP RADIOPHONE. A voice or code transmitter-receiver with a rated working range of fifteen miles on voice and twenty-five miles on code. Designed for use where there is considerable radio traffic.

TYPE M RADIOPHONE. A voice and code transmitter only, weighing about one hundred pounds with a working range of about fifty miles. Designed for communication to the field from Regional Offices.

"STANDBY" RECEIVERS. The Forest Service uses several types of commercially available A. C. receivers depending on the type of service required and the amount of interference to be encountered.

Experiments are also being made with two types of ultra-high frequency radio equipment. Two types in frequent use are now being revised to conform with experience gained during the past season. These two sets are as follows:

T RADIOPHONE TRANSMITTER-RECEIVER. Transmits and receives voice only and weighs from thirty to one hundred pounds with a working range of about fifty miles.

S RADIOPHONE TRANSCEIVER. Transmits and receives voice only. Weighs about ten pounds with a working range of about fifty miles. Its principal features are its portability and the quickness with which it can be put into operation.

Automatic Shotguns

To conform to the recent Federal regulations restricting the use of guns of more than three-shot capacity in the hunting of migratory waterfowl, the Remington Arms Company has announced a series of magazine plugs to be supplied at a cost of only a few cents each to the hunter.

The recent amendment to the Migratory Bird Treaty Act limits the capacity of self-loading and hand-operated repeating shotguns to three shots at one loading when hunting ducks, geese and other game birds.

Owners of such guns now having a capacity of five or six shots can have their magazines stopped with a one-piece plug that cannot be removed through the loading end. The total capacity of three shots covered by the regulation includes the one in the chamber, limiting the magazine capacity to two shells. It is believed that these plugs are a satisfactory solution for the hunter.

Terracing Equipment

An unusually instructive handbook on Soil Erosion Control has just been mailed to twenty-five thousand interested individuals by the Austin-Western Road Machinery Company. The booklet is profusely illustrated and discusses in detail types of erosion, methods of control, and offers special emphasis on the practice and cost of terracing. This booklet Number 1383 has been issued simultaneously with the company's 1935 general catalog.

Vacuum Primer

A new device has been recently placed on the market making possible a very simple yet positive means of priming or evacuating suction lines for pumps which are not of the positive displacement type, that is, the centrifugal or turbine unit. Pumps of this type depend on an auxiliary pump to flood the line and pump before the centrifugal pump is started. The United States Forest Service has found that combinations of this type are not entirely dependable due to various mechanical difficulties which appear after a period of use.

The Hercules Equipment and Rubber Company has developed a new type of vacuum priming device for use with centrifugal type pumps. As installed in five heavy duty pumper units this year it was found on test runs a thirty-eight foot section line of two and one-half inches diameter would require one minute and forty seconds to prime the pump drafting eighteen feet.

Further information concerning any of the above products will be supplied in your self addressed stamped envelope mailed to American Forests, 1711 K Street, N. W., Washington, D. C.

Forest to Protect Norris Lake

In order to protect the Norris Lake, the Tennessee Valley Authority has purchased many thousands of acres of land around its shore line. Much of this is now forest and much more will ultimately be reforested. The Forestry Division of the Tennessee Valley Authority has made considerable progress in the mapping, planning, and organizing of the administration of the Norris Lake Forest, including wildlife, fisheries, grazing and the leasing of small farm areas to part-time forest workers. Ultimately, more than one hundred such workers will probably be given an opportunity to locate premanently in the Norris Lake forest.

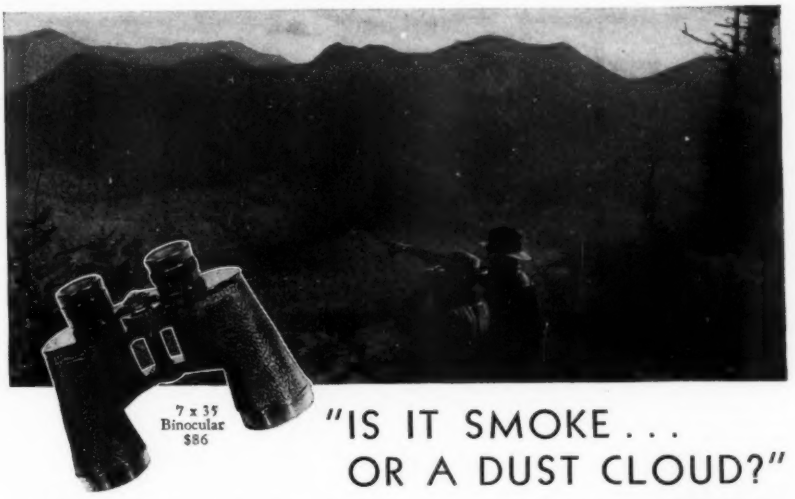
The underlying principle being followed by the Division of Forestry is that of complete, permanent, sustained yield management of all the natural resources present. All forms of land-use consistent with public and private welfare will be developed to as high a degree as proves practical. Included very definitely in this program is the social interest and welfare of the people themselves, their wives and children. The Division of Forestry is striving to demonstrate how forest management can co-ordinate protection of watersheds, the welfare of rural populations, and the development of all the natural resources of the area.

Florida Undertakes Land Acquisition for Everglades Park

Responsibility for speedily acquiring the land in southern Florida preparatory to presenting it to the United States Government as the Everglades National Park has been placed with Fred C. Elliot, Secretary of the Trustees for the Internal Improvement Fund, according to a letter of April 5 from Governor Dave Sholtz of Florida to Harold L. Ickes, Secretary of the Department of the Interior. Governor Sholtz' letter was in reply to one from Secretary Ickes transmitting a report from National Parks Director Arno B. Cammerer recommending that land be secured for the proposed Everglades National Park in accordance with the maximum boundaries authorized in the Act of May 30, 1934, and of the report of the Secretary of Interior dated December 3, 1930. The Secretary pointed out that acquisition of the land for the National Park is now the responsibility of the State of Florida and urged an early completion of this program. Much of the land is now owned by the State and only a relatively small portion will have to be purchased or donated by public spirited citizens.

State Parks Growing Up

State parks throughout the nation have increased by approximately 500,000 acres since 1913. Use of existing state parks and the need of additional areas by the C. C. C. have been large factors in this remarkable increase. Some thirty-two states have added to their park systems areas ranging from a few acres to several thousand. Texas stands far in advance of any other state in point of expansion of its park system, eighteen new state parks, totaling 248,474 acres, having been acquired within recent years. Other states which lead in the expansion of state park areas are California with 28,673 acres; Virginia, with 16,347 acres; Oklahoma, with 13,366 acres; Alabama, with 8,200 acres; West Virginia, with 7,800 acres; Mississippi, with 4,380 acres; New Mexico, with 3,576 acres; South Carolina, with 3,525 acres; Georgia, with 3,520 acres; Washington, with 2,610 acres; New York, with 2,321 acres; Vermont, with 2,240 acres; Arkansas, with 1,952 acres; New Hampshire, with 1,571 acres; and Iowa, with 1,533 acres. All acquisitions have been through gifts to or purchases by the states.



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● To tell true smoke from false, it often takes a good forester—and a good binocular. Any forester who depends on his glass knows the value of wide field of view, brilliant illumination and sturdy construction. These are the features that have been built into the new model Bausch & Lomb Binocular, the glass that was sold to more outdoor men and sportsmen in 1934 than in any other year in history. De Luxe 40-page catalog (at right) on request. Tells how to select a binocular for any use.

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Every axe is balanced to an exacting standard. The weight is so placed that it falls straight and true.

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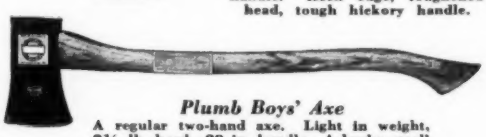
Keen blade, toughened head, husky nail slot. For chopping, splitting, pounding. Length, 13½ in. Weight, 1¼ lb. head. With or without leather sheath.

Plumb House Axe
A husky, one-hand axe for woods or camp. 2¼ lb. head. 19 in. handle. Keen edge, toughened head, tough hickory handle.



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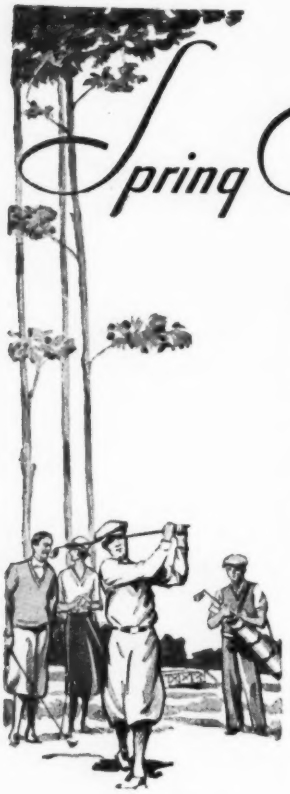
Made of one piece of high-grade steel—not two grades of steel welded together! Hardened for a depth of two full inches and toughened to hold a keen edge. Furnished in 3 to 5½ lb. weights.



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Forestry Questions Submitted to The American Forestry Association, 1713 K St., N. W., Washington, D. C., will be Answered in this Column. . . . . A self-Addressed Stamped Envelope Accompanying Your Letter will Assure a Reply.

\+ + +

QUESTION: The top of a hemlock tree on my farm is dead and the lower trunk of the tree shows where pitch has oozed out. Can you tell me the cause of this and if there is any hope for restoring the tree? F. E. H., Pennsylvania.

ANSWER: The tree has probably suffered during the recent years of drought so that it has become an easy prey to a bark beetle known as the flathead hemlock borer. The resin exudations on the lower trunk are the results of this boring insect but the tree was probably in a weakened condition before the insect attacked it. Entomologists report that they have no authentic record of live healthy vigorous hemlocks being killed by these bark borers but under present conditions there is probably nothing you can do better than to cut the tree down and utilize the wood as quickly as possible.

QUESTION: Has eucalyptus wood grown on the coast of South Carolina any commercial value?—J. D. M., South Carolina.

ANSWER: There is little reason to expect that eucalyptus wood grown in South Carolina would have any commercial value. Several varieties of eucalyptus grow throughout the Southern half of California but it has proved disappointing as a commercial venture.

QUESTION: Have the efforts to control white pine blister rust by destroying gooseberry and currant bushes in the vicinity of white pines proved successful?—G. H., Vermont.

ANSWER: Reports from over the entire country indicate a satisfactory degree of success and prove that the work of eradicating the alternate hosts of the white pine blister rust has proved worthwhile. From Pennsylvania comes the information that studies made in areas where control activities were initiated in 1929 and 1930 show that while twenty-five per cent of the white pines were infected at that time, less than two per cent became diseased after the protective measures were started.

QUESTION: Please advise if the following formula is good for fertilizing shade trees on a loamy soil: 100 pounds nitrate of soda, 400 pounds sulphate of ammonia, 1,500 pounds tankage and 300 pounds of cottonseed meal.—J. D. M., Jr., South Carolina.

ANSWER: The formula is satisfactory, but according to a representative of the United States Department of Agriculture would be improved by the addition of 200 pounds of potash sulphate and 500 pounds of superphosphate.

AMONG THE CURRENT PUBLICATIONS

Residual Wood After Logging in the Larch-Douglas Fir and Lodgepole Pine Types, by I. V. Anderson. Report of the Northern Rocky Mountain Forest Experiment Station, Missoula, Montana. A mimeographed statement of 27 pages presenting the problems of closer and more balanced utilization of these woods in the Northern Rocky Mountain Region.

Pruning, by L. C. Corbett, Farmers' Bulletin No. 181, United States Department of Agriculture, Superintendent of Documents, Washington, D. C. Price five cents. A reprint of a successful treatise on the pruning of young trees and ornamental plants for the stimulation of growth, the determination of form, and the distribution of fruits and flowers.

Observation on Forest Pathology as a Part of Forestry in Europe, by Dow V. Baxter. Bulletin No. 2 of the Michigan School of Forestry and Conservation, Ann Arbor, Michigan. An analysis and interpretation of the part played by forest pathology in the practice of forestry in certain sections of Europe, with special reference to American trees planted in Europe and those European species which have been successfully planted in this country.

Suggestions for Pheasant Management in Southern Michigan, by Howard M. Wight, published by the Department of Conservation, Lansing, Michigan. Based on five years' intensive study by the School of Forestry and Conservation at the University of Michigan in the Williamston area of Southern Michigan. Recommendations are given for increasing the pheasant population in any given region.

Pools for Home Grounds, by D. J. Bushey. Bulletin 265, Cornell University, Ithaca, New York. Simple directions for building pools and for maintaining plant life within them.

Woody Plants that Tolerate Shade, by R. W. Curtis and Donald Wyman. Extension Bulletin 268, Cornell University, Ithaca, New York. Contains list and descriptions of ornamental shrubs and some trees suitable for planting in partial shade.

Growing Wood as A Crop on New York Farms, Part I., Trees and Products, by J. A. Cope, Cornell Extension Bulletin Number 270, November, 1933, published by the New York State College of Agriculture, Cornell University, Ithaca, New York, 38 pages, illustrated. The principal wood-lot trees of New York State are listed with suggestions for cutting and marketing them to advantage.

Testing and Selection of Commercial Wood Preservatives, by E. Kamesam, Forest Bulletin No. 81 of the Forest Research Institute, Dehra Dun, India. A 40 page bulletin describing methods for wood preservation under conditions existing in India.

Control of Injurious Rodents in California, by Tracy I. Storer, Circular No. 79, University of California, Berkeley, California. A bulletin describing the life history and methods of control of ground squirrels, tree squirrels, pocket gophers, moles, muskrats, rabbits and various kinds of rats and mice.

Book Reviews

LOGGING—PRINCIPLES AND PRACTICES IN THE UNITED STATES AND CANADA, by Nelson Courtlandt Brown. Published by John Wiley & Sons, Inc., New York City. 284 pages, illustrated. Price, $3.50.

Logging is so largely a factor of regional topographic and climatic conditions that adequate treatment of the subject demands wide experience and careful observation on the part of one who would discuss it. Professor Brown has been fortunate in his many opportunities to observe logging methods and in this new book, "Logging—Principles and Practices in the United States and Canada," portrays the subject from the point of view of an entire continent.

Without attempting to describe any method or region exhaustively, the author has divided his work into two parts. Under Part I the principles underlying logging are discussed and the tools used are described. In Part II the continent north of the Rio Grande is divided into sixteen regions and the logging methods of each one are described in considerable detail.

While primarily designed for students, the book will serve as a reference to foresters and lumbermen in active work. It brings within a single volume a comprehensive yet practicable description and appraisal of the methods used in the conversion of standing timber into forms useful in human economy and arts including the harvesting of the forest crop, the transportation of the raw materials to market and their manufacture and merchandising.—G. H. C.

WE CAN TAKE IT! by Ray Hoyt. The American Book Company, New York. 128 pages. Illustrated by Marshall Davis. Price, 25 cents (paper); 60 cents (cloth).

Much has been written about the tangible benefits of the Civilian Conservation Corps, about man-building, about the forests, but this book, actually a short story of the C.C.C., deals with the intangibles, focusing the spotlight on what the author calls "the spirit of the Corps."

He defines this spirit as something new, something that came into being with the Corps, something that smacks of patriotism, something that springs from the soil. This spirit, the author believes, although he likes to call it patriotism, involves trees and hillsides and streams and is fused with interest in family and future. And it looks upon a government with gratitude for something given—nothing taken away.

To accept these views from one who may call himself an observer might spell debate. But Mr. Hoyt's opinion is not second hand. He has lived with the men in their camps, rubbed elbows at their mess tables, worked with them and shared their play. So what he has to record is enlightening, often dramatic, and delightfully human. He makes this new spirit so real that the accomplishments of the Corps, the physical accomplishments, rear up as the logical, natural outgrowth of normal youth. And if this is true of the C.C.C., this great "experiment" in natural and human conservation has reached a stage where America needs it as much as its youth.—E. K.

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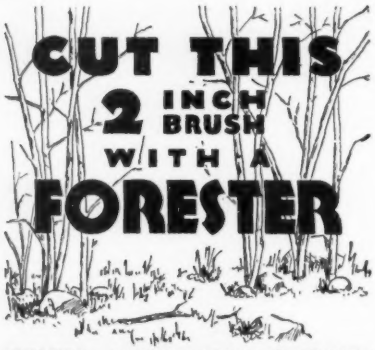

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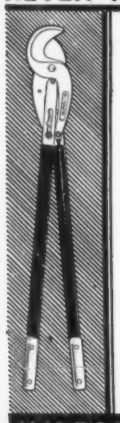

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Conservation Calendar in Congress

Published monthly while Congress is in session as a service to the members of The American Forestry Association. This calendar contains bills introduced in the First Session of the Seventy-fourth Congress between March 18 and April 15, as well as any action taken on bills previously listed.

BILLS APPROVED

H. R. 6644—BUCHANAN—Deficiency appropriations for year ending June 30, 1935. Passed House March 13. Passed Senate March 19. Approved March 21. Public Law No. 21.

H. R. 5255—OLIVER—Appropriations for the Department of Commerce. Passed House February 8. Passed Senate February 25. Approved March 22. Public Law No. 22.

H. J. Res. 117—BUCHANAN—Appropriations for relief purposes. Passed House January 24. Passed Senate March 23. Approved April 8. Public Res. No. 11.

H. R. 2881—BUCK—For the adjustment of contracts for the sale of timber on the National Forests. Passed House March 4. Passed Senate March 29. Approved April 17.

APPROPRIATIONS

H. R. 6223—TAYLOR of Colorado—Appropriations for Interior Department. Passed House March 4. Passed Senate amended April 16.

H. R. 6718—SANDLIN—Appropriations for the Department of Agriculture. Passed House March 15. Passed Senate March 29. To Conference Committee April 9.

NATIONAL FORESTS

H. R. 6838—WHITE—Sale of small home sites in National Forest lands to persons permanently employed in vicinity, etc. To Agriculture March 19.

H. R. 6544—STUBBS—To conserve water resources and encourage reforestation of watersheds of Santa Barbara County, California, from location and entry under mining laws. Report 526 March 29.

H. R. 6914—FULMER—Acquisition, administration and management of State Forests. To Agriculture March 21.

H. R. 4459—PIERCE—(S. 1680—MCNARY) Including within Deschutes National Forest, Oregon, certain public lands. Report 585 April 5.

NATIONAL PARKS

H. R. 7086—WALLGREN—Establishing Mount Olympus National Park. To Public Lands March 28.

S. 2417—POPE—To establish the Shoshone Ice Caves National Park of Idaho. To Agriculture and Forestry March 27.

S. 2073—BYRD—To provide for the preservation of historic American sites, buildings, objects and antiquities of national significance. To Library February 28.

S. Res. 102—WAGNER—Authorizing Committee on Public Lands to investigate establishment of additional National Parks and changes in other National Parks. To Public Lands and Surveys March 14.

S. 2289—JOHNSON—To establish Kings Canyon National Park, California, and including lands now on General Grant National Park. To Public Lands and Surveys March 18.

S. 1307—NORRIS—(H. R. 4878—LUCKEY) To establish a National Monument on Daniel Freeman Homestead, Nebraska. Passed Senate March 29.

S. 2185—MCNARY—(H. R. 6962—MOTT)—(S. 1876—MCNARY) Amending act accepting cession by Oregon of exclusive jurisdiction over lands embraced within Crater Lake National Park. Report No. 484 April 15.

H. R. 6465—DEROUEN—Accepting cession by Arkansas of jurisdiction over all lands included within Hot Springs National Park, Arkansas. Report 522 March 28.

S. 654—THOMAS—Exchange of lands reserved for Seminole Indians in Florida. Passed Senate March 29.

PUBLIC DOMAIN

S. 2231—WAGNER—Prohibiting homestead entry on certain public lands. To Public Lands and Surveys March 12.

H. R. 3019—DEROUEN—Amending Taylor Grazing Act of June 28, 1934. Report 479 March 25.

WILDLIFE

H. R. 7052—WERNER—Transferring Wind Cave National Game Preserve from Department of Agriculture to Department of Interior. To Agriculture March 27.

S. 2332—MCNARY—Amending Migratory Bird Hunting Stamp Act of March 16, 1934, and certain other acts relating to game and other wildlife administered by the Department of Agriculture, including transfer of the Wind Cave National Game Preserve to the Department of the Interior. To Special Committee on Conservation of Wildlife Resources March 21.

H. R. 6952—ANDERSON—Facilitating acquisition of migratory-bird refuges. To Agriculture March 22.

H. R. 6726—FERGUSON—Construction of reservoir on Salt Fork of Arkansas River in Oklahoma for control of floods and as migratory-bird refuge. To Flood Control March 14.

MISCELLANEOUS

H. R. 6594—ROBINSON of Utah—(S. 738—WAGNER) To aid in providing the people of the United States with adequate facilities for park, parkway, and recreational purposes. Report 586 April 5.

S. 2384—COPELAND—Cooperation with the States in promotion of conservation education in public elementary schools, high schools, colleges and universities, etc. To Education and Labor March 26.

H. R. 7054—DEMPSEY—Providing for protection of land resources against soil erosion and providing that the Secretary of Agriculture shall direct and coordinate all Federal activities with relation to soil erosion. Passed House April 1. Passed Senate April 15.

S. Con. Res. 3—WAGNER—Creating conservation week. Agreed to by Senate March 29.

S. 82—GEORGE—(H. R. 60—TARVER) For the disposal of surplus personal property of the Emergency Conservation Work. Passed Senate March 29.

Jackson Hole Elk Situation Improved

The serious food shortage which threatened the elk herd at the Jackson Hole refuge, in Wyoming, late this past winter, has passed, according to the Biological Survey. Sufficient hay has been obtained to feed the herd until it returns to its summer range in the southern part of Yellowstone National Park.

Although the past winter was unusually severe, driving thousands of elk to the refuge feeding grounds and creating a serious feeding problem, losses will not be great, it was announced, and the herd as a whole will return to the range in good shape.

It was pointed out that during normal winters the supply of hay raised on the refuge will feed the herd without much difficulty. The increase in the herd during the past winter, and the drought of last summer which resulted in an unusually low hay supply, created a serious situation among the magnificent wapiti.

Most of the 20,000 or more elk that make up the Jackson Hole herd find their winter food normally outside the refuge, according to the Biological Survey, but many are forced to join the "bread line" nearly every year, and during severe winters like the past one the number dependent on hand-outs mounts into the thousands. The largest number heretofore counted on the refuge feeding grounds was 11,239, in 1933. In January, 1935, there were more than 9,000 elk at Jackson Hole, and in February, while the count is not available at this time, it is estimated that the number far exceeded the 1933 figure.

200,000,000 Seeds for Shelterbelt

Two hundred million tree seeds, mostly hardwood, and enough to plant 2,000 miles of shelterbelt strips have been collected for the prairie shelterbelt project, it has been announced. The seeds were gathered by the Forest Service, the Civilian Conservation Corps, and with shelterbelt labor. They will be planted in nurseries this spring and replanted as seedlings during 1936.

At the same time it was announced that the planting of 3,000,000 seedlings this spring is well under way. The initial plantings were in Texas, Oklahoma and Kansas, with plantings to follow in Nebraska, North Dakota and South Dakota. Practically all of the seedlings are hardwoods.

Nearly 3,000,000,000 seedlings will be needed to complete the shelterbelt planting project. They will be planted in strips 135 feet wide. Thus, upon completion there will be nearly 28,000 miles of these strips running from Texas to the Canadian boundary.

New York to Open Conservation Celebration in May

The opening event in the celebration of fifty years of conservation in New York State will be a dinner at Albany on May 15, according to Lithgow Osborne, Conservation Commissioner. The celebration will continue throughout the summer, with many events scheduled, ending in a great outdoor rally at Lake Placid September 12, 13 and 14, at which President Roosevelt is expected to speak. Plans for the celebration are being formulated by a committee of one hundred appointed by Governor Herbert H. Lehman.

Plans for the Lake Placid rally include a pageant and parade, sports and athletic events, and dedications of tablets and roadside markers.

Fifty years ago, on May 15, 1885, the first effective action toward conserving the State's natural resources was taken when a law was passed establishing the Forest Commission.

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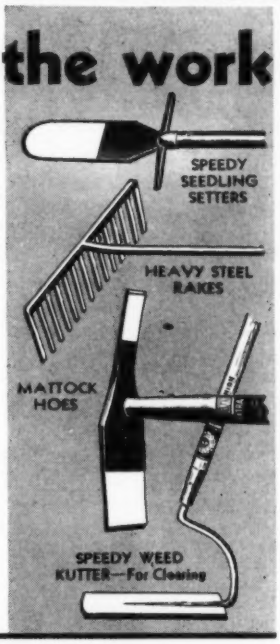

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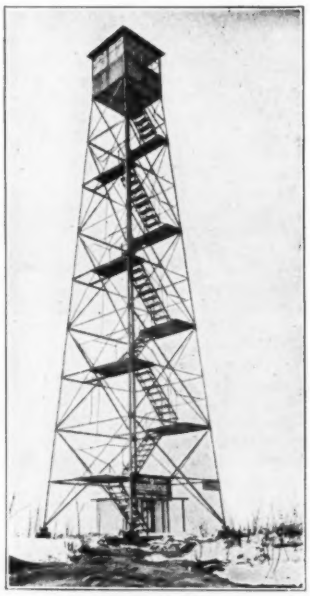

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FORESTRY IN CONGRESS

By G. H. COLLINGWOOD

Immediately after signing the Work Relief Act on April 8, President Roosevelt issued an Executive Order allotting $30,000,000 to the Civilian Conservation Corps, which from April 1 had continued on credit in the faith that the bill would be passed and the funds made available. At the same time he allotted $842,000 to continue conservation and other work on Indian reservation lands. Before the bill was agreed to by the House and Senate on April 5, a section was added continuing the C.C.C. until March 31, 1937. Inclusion of this section makes unnecessary the passage of the Walsh-Darden bills. The $600,000,000 provided in the Act for the Civilian Conservation Corps may be increased by as much as $800,000,000 at the discretion of the President, making a possible total of $1,400,000,000.

Actual administration of the huge fund appropriated in the Act rests with the President, but the land-use program will probably be directed by Under Secretary Rexford G. Tugwell. This includes $350,000,000 for "sanitation, prevention of soil erosion, reforestation, forestation, flood control and miscellaneous projects," together with $500,000,000 for "rural rehabilitation and relief in stricken agricultural areas" and some supervision concerning the $100,000,000 for rural electrification. To any or all of these the President may add one-fifth of the total appropriation or in the neighborhood of $800,000,000, so that Dr. Tugwell will probably have over a billion dollars with which to shape a gigantic program based on the report of the National Resources Board and other planning studies. This may include soil erosion control, forestation and reforestation, migratory bird protection, subsistence homesteads, new crop uses of land and the retiring of from 75,000,000 to 225,000,000 acres of submarginal lands.

Of these vast sums the Forest Service hopes to receive $200,000,000 for the building of highways, roads and trails on the National Forests as well as for the reduction of fire hazards, timber stand improvements, pest control and general improvement, and $60,000,000 for continuing the forest acquisition program under the National Forest Reservation Commission. The combined allotments to the Forest Service and the Bureau of Entomology and Plant Quarantine for control of white pine blister rust and to fight attacks of western pine beetle may aggregate $5,000,000, while a separate allotment of over $2,000,000 to eradicate the Dutch elm disease is hoped for.

No progress has been made on any features of the Omnibus Forestry Bill, but on March 30 President Roosevelt assured Senator Fletcher, of Florida, that he is awaiting a favorable opportunity to present a program for the consideration of Congress.

"What I have in mind," continued the President, "is a rounding out of existing legislation supplemented by new provisions and altogether something which will supply an organic basis, so far as we can now foresee it for the next ten or fifteen years.

"It will be necessary to provide for such things as public acquisition of forest lands, a strengthening of the provisions for making existing National Forests and those to be acquired fully productive, and in doing so to afford the opportunity for the relief of unemployment and stabilization of local communities, an authorization of the shelter belt, a well coordinated program of forest research, and finally, comprehensive provision in a variety of fields for stimulating and insuring both State and private activities.

"Accordingly," he concluded, "I hope in the near future to get in touch with you and possibly other leaders in the Senate and the House as to the best means for obtaining the enactment of such a legislative program."

While the Work Relief Bill was delayed by discussion in the Senate the Agricultural Appropriation Bill, H.R. 6718, passed the House on March 15, and was approved by the Senate after a single afternoon of public discussion on March 29. The Senate approved its committee recommendations for increases of $3,869,025 and added several hundred thousand dollars more by amendments introduced on the floor. Increases in which the Forest Service is interested aggregated $410,297 and would bring the total for that bureau to $11,620,973. These included an addition of $120,297 for the forest survey of the United States bringing the total to $250,000. Senator Elbert D. Thomas, of Utah, introduced an amendment increasing by $250,000 the item for soil erosion investigation in the Department of Agriculture. This brings the total for research in soil erosion control methods to $531,362. A third increase of $40,000 for range investigations to be administered by the Northern Rocky Mountain Forest Experiment Station was included.

Efforts to restore the Budget estimate of $200,000 for "code compliance inspection" were unsuccessful, largely on the ground that such an appropriation would involve a policy on the part of the President and the Government of enforcing every code. Chief Forester F. A. Silcox pointed out to the Senate Committee that the Lumber Code differs from most others in that it deals with natural resources and that the money would be spent to determine whether the conservation policies of the code are being carried out. In case the N.R.A. is not continued, the Chief Forester explained, such an appropriation would permit the government to undertake cooperation with private timberland owners for conservative forest practice upon their lands. It resolves itself, he said, into the question of whether the Federal Government should force timberland owners to recognize a public responsibility in handling their timberlands.

The amounts of $261,156 for Dutch elm disease and $250,000 for white pine blister rust control as recommended by the Budget were maintained without change in the House and Senate. In submitting the bill to the Senate the subcommittee stated:

"The committee is of the opinion that more funds should be appropriated for investigation and control of the Dutch elm disease and blister rust, but in view of the fact that appropriations contained in the Emergency Relief Appropriation Act of 1935 will be available for allocation for these purposes, it has not increased the amounts carried in the bill for these purposes. It does feel, however, that sufficient funds should be allocated from relief appropria-

tions to carry on these important control projects and has faith in believing it will be done."

While such a statement has no legal status, it may influence the allocation of funds appropriated in the Work Relief Act.

The items of $50,000 for the Institute of Forest Genetics at Placerville, California, and of $75,000 for a forest experiment station in Colorado were not changed by the Senate.

Increases of $749,198 for the Biological Survey included an addition of $110,000 for more adequate protection of migratory birds, bringing the total for this purpose to $277,988; $546,308 for the control of predatory animals, completing the $1,000,000 authorized annually for ten years in the Act of March 2, 1931; and new items totaling $92,890 to make $164,486 available for enforcement of the Alaska Game Law.

Referring to the pressure from many sides to close the season against all shooting of ducks and geese, Mr. Darling assured the committee that the increase of $110,000 is desired "merely for a normal carrying out of the enforcement of the Migratory Bird Act." He said further that the enforcement of a closed season would cost at least $350,000 additional.

Rapid progress was made by the House in support of the concerted action of Secretaries Ickes and Wallace in transferring the Soil Erosion Service to the Department of Agriculture. On April 1 the House passed H.R. 7054, introduced by Representative Dempsey, of New Mexico, outlining the Federal policy of erosion control and providing that the Secretary of Agriculture shall direct and coordinate all Federal activities with relation to soil erosion. This takes the place of bills introduced by Representative Nichols, of Oklahoma, and would give Congressional approval to the transfer.

The bill leaves to the discretion of the Secretary of Agriculture the manner in which soil erosion shall be administered, but Representative Nichols urged amendments creating a separate division in the Department of Agriculture to be known as the "Soil Erosion Service," and extending from four months to six months when the present personnel can be maintained without regard to Civil Service laws. This would allow time to arrange satisfactory examinations to serve as the basis for permanent appointments.

Among the recently introduced bills relative to the National Park Service is H.R. 7086 introduced by Representative Wallgren, of Washington, to create the Mount Olympus National Park on the Olympic Peninsula in the State of Washington. The Mount Olympus National Monument, of 298,730 acres, is the nucleus of the proposed National Park. To this the bill would add approximately 300,000 acres in the surrounding Olympic National Forest. Addition to the National Forest lands would create a National Park of about 600,000 acres. The monument was set aside from within the Olympic National Forest by President Theodore Roosevelt under an Executive Order dated March 2, 1909, for the primary purpose of protecting the Roosevelt elk, whose range is limited to the peninsula from depredations by hunters operating under the guise of prospectors and miners. Subsequently under Executive Orders issued by Presidents Taft, Wilson and Coolidge the monument was reduced to include about one-half the original area and the lands returned to the National Forest. The monument as well as the surrounding National Forest was originally administered by the supervisor and personnel of the Olympic National Forest, but in accordance with the Executive Order of June 10, 1933, all National Monuments, including this one, were transferred to the National Park Service.

As now constituted, nearly four billion feet of standing fir, spruce, hemlock and other timbers are in the monument, while the proposed additions would add approximately thirteen billion feet of mature merchantable timber of similar species. Local citizens point out the danger of losing investments of millions of dollars in such Olympic Peninsula centers as Gray's Harbor involving the employment of several thousand workers, if these forest lands are placed in a National Park.

Reporting in favor of the proposed National Park, Secretary Ickes wrote:

"The proposed bill has been drafted to provide relief for a widely divergent variety of interests. By restoring the original area of the monument protection will be afforded permanently for the winter range of the elk. At the same time sufficient hunting grounds will be excluded. Hunting is not permitted in National Parks, but the sanctuary they provide improved hunting in adjacent territory."

"Except for Alaska," he pointed out, "this section is the last frontier wilderness in the United States. It contains the only remaining stands of those magnificent forests that clothed the Pacific slopes from Northern California through British Columbia. Centuries old, these giant Douglas firs, spruces, hemlocks and cedars once rose to heights of 300 feet in dense stands. Only the Sequoias of California rivalled these forests in impressiveness, beauty and age."

Hearings on S. 2073, introduced by Senator Byrd, of Virginia, to provide for the preservation of historic American sites and antiquities of national significance under the National Park Service and to create an "Advisory Board on National Parks, Historic Sites, Buildings and Monuments" composed of eleven persons, were held by the House Committee on Public Lands on April 2.

In spite of local opposition from water power and irrigation interests, sportsmen and others to the transfer of the Kings River Canyon in the Sequoia National Forest, in California, to the National Park Service and its inclusion with the General Grant National Park as the Kings Canyon National Park, Senator Johnson has indicated his intention to proceed with hearings on S. 2289. John Muir proposed the Kings Canyon area as a National Park about 1890, and several years ago a bill similar to the present one was opposed on the grounds that under the policies of the National Park Service the Kings River could not be impounded for power or irrigation purposes, the timber could not be cut and all hunting would be prohibited.

Senator McNary, of Oregon, has introduced S. 2332 amending the Migratory Bird Hunting Stamp Act of March 16, 1934, and carrying an inconspicuous rider proposing to transfer the Wind Cave National Game Preserve to the Department of the Interior where it would be consolidated with the Wind Cave National Park, in western South Dakota. The bill has the approval of both Departments and will probably be favorably acted upon.

Basswood in New York State !

The importance of basswood in the northern farm woodland is emphasized in a recent report of the New York section of the Society of American Foresters showing that 128 New York State firms used 158,000,000 board feet of basswood during the year 1933. The report stated that 91 per cent of the basswood used by these firms was grown in New York State.

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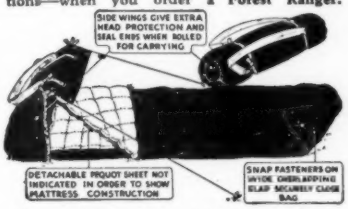
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Mixed His Cues

Bob Jenks upon his wedding day
Was a most excited creature;
He handed his bride the marriage fee
And tried to kiss the preacher.
—*Boston Transcript.*

Foul!

Sunday School Teacher: Who was Eve?
Bright Scholar: The first chicken that ever ruined a man's garden.

Self-Evident

Teacher: "Which hand is the Statue of Liberty holding over her head?"
Smart Kid: "The one with the torch."
—*Ski-U-Mah.*

Income, or What Have You?

"SECRETARY OF THE TREASURY,
Washington, D. C.

My dear Sir:

"The enclosed form on which I am asked to make a record of my income for the last fiscal year is returned to you with my respects and my deepest appreciation of this subtle form of flattery. I am particularly impressed by its resurrection of old forms and figures of English speech such as 'compensation from outside sources,' 'net profit received,' 'income from rents,' 'interest on bank deposits,' etc.

"One question I got a great laugh out of was 'Were you during the taxable year supporting in your household one or more persons closely related to you?' There are so many persons closely related to me staying at my house that I am what you would call surrounded. Only the other day, three more distant cousins of my wife's blew in, making a new high for the movement. And one of them brought a friend. For the last four years my house has been full of strangers, all claiming to be my cousins or aunts or something.

"The blank says it will allow me $400.00 for each dependent relative and I would say the government is overpricing them, as I would trade the entire lot for $11.00. (Two of my wife's aunts you can have for the asking.)

"The blank also asks me to 'Describe your business as provided in Item No. 2, and I am glad to answer—Lousy, Mister Secretary, Lousy.'

"Then you say something about allowance for 'obsolescence, depreciation and depletion.' That's where I come in. As an American business man, I am a study in obsolescence. I am depleted, deflated, depressed, denatured, denounced, deranged and dejected.

SAPLING SAM."

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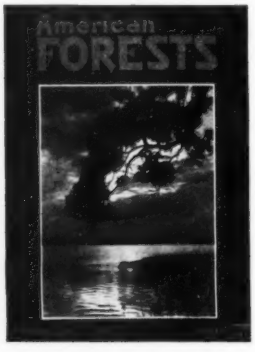

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May, 1935

REMOVING THE "DEATH" FROM DEATH VALLEY

(*Continued from page* 218)

the National Park Service undertook the improvement of the existing automobile trails. A small Public Works allotment was secured in addition to the amounts allowed for carrying on the work of the Civilian Conservation Corps. When work closed down for the summer in May, 1934, the improved conditions were very evident.

Starting from scratch, there was first developed at the Cow Creek site of the C.C.C. camp, a water supply of 25,000 gallons daily, brought to a concrete reservoir. The camp buildings were of wooden construction, semi-permanent. A machine shop and garage for equipment maintenance and a temporary storehouse were erected. Telephone connections were made with the local system of the Pacific Coast Borax Company, and the Army installed a radio set for direct communication with District Headquarters at March Field. Four small dwellings were built, one of which was used for a ranger checking station at the mouth of Furnace Creek Wash. Two comfort stations for public use, with all sanitary facilities, including automatic hot water showers, were erected of native stone, with tiled roofs. Two sewage disposal systems were also completed.

For direct benefit of visitors, 290 miles of smooth, safe, natural gravel roadways were graded and maintained on main routes, and to points of greatest interest; several miles of foot trails were completed; and six wells of good water adjacent to main roads were developed, curbed and fitted with hand pumps. Five public camp grounds were laid out, and pit toilets placed in all except the large main camp at Furnace Creek, where a comfort station had been constructed.

The response was immediate and enthusiastic. From an estimated traffic of 9,000 visitors during the 1932-33 season, more than 22,000 persons visited Death Valley during the year 1933-34. More than double this number will be registered during the present season, judging from registrations to date and prospects for the next few months.

Increased travel aggravated dust conditions, and taking cognizance of the danger and discomfort from this source, the National Park Service allotted sufficient funds to oil forty miles of the most heavily traveled route during the present season. This improvement is rapidly approaching completion. The recent purchase of the toll road approach and plans for its improvement and oiling by the State of California, and the completion in the next few months of the oiled highway in Nevada from Las Vegas to Death Valley Junction, assures Death Valley of a fine oiled highway from Salt Lake City, Utah, or from Kingman, Arizona, over transcontinental routes No. 91 and No. 66, from Boulder Dam directly through Death Valley National Monument to the Owens Valley, thence either to northern or southern California.

The problems of developing a virgin unspoiled area, such as Death Valley, without detracting from its charm either by marring its natural features or too highly developed civilization, are many and complex. Distances are great, and points of interest widely scattered. The public demands immediate access to natural features of which they have heard or read, and new features are being discovered frequently. This will continue for many years.

Photograph by Crandall

MAGNOLIA TREE

By Robert Sparks Walker

Somehow its evergreen dark dress
That hides its body's nakedness
From day to day throughout the year,
Seems to be lacking in good cheer
Until the coming of its bloom
With its soft hue and rich perfume,
And crimson seeds that hang from threads
With fragrant ointment on their heads.

Park officials have planned carefully and gone ahead slowly with any improvements of a permanent nature. This applies not only to roadways and routes, but to buildings, campgrounds, or centers of temporary population. In the meantime it is absolutely necessary to keep existing routes in a safe and comfortable condition for travel.

It is the hope that high standard roadways, with heavy cuts and fills, and ruling maximum grades, can be kept out of Death Valley entirely. Owing to the fact that it is on a direct route from Boulder Dam to the Pacific Coast, there is bound to be an ever increasing demand for a fast highway. It is planned for one north and south route and one east and west road of a safe and hard surface type. Even these two routes, however, can be fitted to the natural contours with long easy curvature, and comfortable rolling grades, making little scar on the country traversed. All other roads should be of a much simpler type, rambling through the country and up the canyons, wide enough for safe passing, and possibly oiled on the favored routes—but with only such grading as to make them comfortable riding and reasonably safe.

If the above policy can be adhered to, Death Valley will still be an adventure and delight for thousands of winter visitors, who will return season after season.

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LOOKING AHEAD WITH THE C. C. C.

(*Continued from page 214*)

be given the Army officers for their conduct of the camps, the discipline and care of the men, and in general for their fine co-operation in a great program quite foreign to Army routine. It was, however, a serious mistake to place the educational work under the Army. The duties of running a C.C.C. camp are said to be more difficult and more diverse than those confronting a captain in wartime. Certainly there is no time available for considering such subjects as education. The work projects are themeselves educational, and any educational program should have been entrusted to the work agencies. If the same high standards had prevailed in the selection of educational advisers as in the selection of the supervisory technical personnel, the educational program would be much farther advanced. In many cases excellent work was being done along educational lines by the supervisory personnel before the present system was adopted. The salary given to the educational advisers is sufficient to attract men of considerable attainment.

Naturally this situation is being gradually improved. The camps were not constructed with a view to carrying on classroom work or for quiet reading, and in most cases lighting facilities are entirely inadequate for night study. There should be a well lighted building for this purpose in each camp.

Then there are a good many days in the course of a year when outdoor work is impossible. The men are required to make up these days, insofar as is possible, by working Saturday. Why not take advantage of these "bad weather" days and Saturday forenoons for such classroom work as is given in the camps and credit the men with time spent in this way just the same as for work? The men would be in better condition for mental application and would undoubtedly prefer it.

A camp garden would be a valuable adjunct to the educational facilities. Many of these men may later settle on subsistence homesteads and should know the rudiments of gardening.

One of the newest and best measures to keep the men contented is the routing of high grade theatrical companies around a camp circuit. These companies are on relief paid partly by the Federal government and partly by the states.

In pointing out these weaknesses in the C.C.C. there is no intent to minimize its accomplishments. These have varied, no doubt, in different regions. Some administrators have had too many camps to manage successfully, others not enough. Some have stressed road building; others recreation or forestry, according to their own particular interests. The Forest and Park Services were at first too handicapped in their inspectional forces to require uniformity of standards. This condition is being improved.

Perhaps real forestry or silviculture has not received as much attention as the President intended. This defect is partly due to the scarcity of trained foresters and to the fact that in some states the work is administered by politicians. This condition can be gradually rectified through proper inspection service and gradual readjustment of camps. In general, publicly owned forests should receive all the attention they need before camps are allocated to work on private forests, except in the case of insect and plant pest control where the escape of these pests might destroy the public and private forests alike. More intensive work in protecting private forests from fire may be justified when there is assurance through the National Recovery Administration or otherwise that these protected forests will be properly managed by their owners. Road building is an essential preliminary to protection and the practice of silviculture. It is absurd in a movement which aims at forest development to limit the road building program to the needs of protection and recreation. Many secondary roads are needed in any forest handled under a selection system; but these roads should be inexpensive in construction and maintenance.

We may assume that every President likes to establish as many monuments to himself as possible. What could have constituted a better monument to President Franklin Roosevelt than a well established and efficient C.C.C. for the training of young men placed upon a permanent basis apart from the exigencies of relief? The present Congress seemed to offer the opportunity for such an establishment for the C.C.C. is not likely to ever be more popular than at present. If it is doubled in size it will tax administration officers to the utmost to mainain the present standards of accomplishment. If the bars are still further let down to the spoils system, as has been intimated in Congress, its future is doomed.

FOREST SCHOLARS

(*Continued from page 227*)

may study the diversified conditions of the two sections.

Last summer I had a chance to talk with several of the students who had completed their two summer's work and had been awarded Vocational Forester certificates. I asked them what they intended to do when they finished their schooling. Strangely enough, only a few of the boys with whom I talked plan to devote their lives to the profession of forestry. Some want to teach Vocational Agriculture, some want to farm. All want to be close to the woods and the fields and the earth. But no matter what life work they choose, forestry will form some of its background.

I asked one boy, the son of a tenant farmer, what good it would do him to practice forestry on land belonging to someone else. He looked at me in surprise.

"Why," he said, "I don't always intend to work for the other fellow. I am going to have my own farm, and I am going to make my woods pay as large a dividend as any crop I have in the ground."

Another, whose father was a large land owner, confided that he was going home and map out a fifty-year management plan for every acre of forest land that his family owned.

"That's a pretty big order, isn't it," I asked, "making a plan for fifty years?"

"Some day," he replied, "I've got to make those acres pay me to own them, and I might as well begin now."

Another student had his heart set on being a forest ranger in one of Uncle Sam's National Forests of the far west.

"I want to live in the mountains," he said, "in real mountains and big woods. I want to do my part in helping preserve the richest and most important asset in the United States. I have no other ambition than to spend my life being a guardian of trees."

Under the leadership of these men of tomorrow, the south is coming forward to take its place among the forestry-minded sections of the nation.

NATURE'S THREE-FINGERED VILLAIN

(*Continued from page* 213)

soap suds—that from an ordinary laundry soap is excellent—is a good preventive and precautionary measure. To play safe it is well to repeat the washing after a complete removal of the first lather.

When signs of a case of ivy poisoning appear, a cure may be effected by applying a five per cent solution of ferric chloride, an iron salt, dissolved in equal parts of alcohol and water. This remedy will, of course, cause stains, like ordinary rust stains, to appear on cloth with which it may come in contact. These stains may be removed as rust stains are. Another remedy, and one of the most effective, is the old snake-bite remedy, potassium permanganate. This substance, an inexpensive deep-purple crystalline solid, is applied in a four per cent water solution. As it acts it stains the skin a deep chocolate color, which makes very unsightly blotches. These can be removed, after the cure, by washing with lemon juice. Where these stains make the use of potassium permanganate inadvisable, calamine lotion or some similar preparation of zinc oxide, lime-water, and a dash of carbolic acid may be used. Recently an extract of the plant has been used, hypodermically, or in very limited doses orally. Such a remedy is, of course, best used under a physician's care.

The itching may be diminished for a time by holding the affected part in water as hot as can be borne, or by soaking the swollen area with a solution of Epsom salt. If the blisters are opened, by a sterile needle, considerable relief is gained from the throbbing and the tension of the skin. Many persons fear that the watery liquid within the blisters must itself be poisonous and contact of other parts of the body with it spread the affliction. This has been shown to be untrue as the watery liquid is not at all dangerous.

It was only natural that the effects of a plant as common and as harmful as the poison ivy should long since have caused those possessed of a healthy sense of curiosity to ask what is responsible for its particular behavior. Various experimenters have sought the answer, but only recently has the truth been discovered. The work was done by two young men, W. D. Graham and Vincent Mattacotti, in collaboration with a professor of chemistry at the Hall Laboratory at Wesleyan University. In the early experiments ivy leaves were used. And although a total of something over 900 pounds of leaves was employed, the amount of poison obtained was disappointingly small, and the time required for its isolation was too long to make further studies with the leaves seem attractive. As a consequence, the experimenters next tried the bark, which was stripped from freshly cut ivy branches.

It was found that the bark from ivy cut in the winter contained but little poison; hence, supplies of bark were gathered in the spring and summer. Bark, in batches of about thirty pounds, was extracted with boiling alcohol for four days. The alcohol was removed and concentrated by distillation, whereupon, after cooling, large amounts of waxy impurities settled out and were removed by filtering. The filtrate, which was deep red in color, was then extracted with xylene. This is a colorless liquid obtained from coal tar by distillation and is much like benzene, which is sometimes also called benzol. When the xylene solution of the poison was dried and concentrated, more of the waxy impurities appeared and were filtered out. The liquid residue was distilled at a low pressure—that is, in a vacuum—and the poison obtained as a high-boiling yellow oil. From thirty pounds of bark one can procure by this process up to one-third of an ounce of the poison.

This material is not a single substance but is a mixture of several closely related compounds. The poisonous mixture is known as urushiol, because the same mixture was found earlier in a Japanese tree used as a source of a lac, and was given this name by its discoverer, the eminent Japanese chemist, Majima. To describe it exactly would require a discussion of advanced organic chemistry, but we may say that the urushiol substances are somewhat distant relatives of carbolic acid. They are also related to benzene, the coal tar product. They have a long fifteen carbon atom chain attached to the benzene part of their structure. Their toxicity has been shown to depend upon the presence of groups of oxygen and hydrogen atoms, hydroxyl groups, also attached to the benzene nucleus. That these groups are the ones involved in the poisoning action of urushiol was proved by replacing the hydrogen atoms by certain different groups, whereupon the new product was found to be non-toxic.

The best seasons for the enjoyment of woodlands and forests lie just ahead. Those who learn to recognize the "three-fingered villain" poison ivy, and who take proper precautions to avoid the action of its poisonous oil will gain most from Nature's generosity in the days to come.

THE GOD OF NATURE

(*Continued from page* 229)

advantages in living only a day. There are no homes to be built, for none are used. There is no searching for food, for none is eaten—in fact, Mayflies do not even have mouths with which to eat if they so desired.

It must not be supposed from their name that Mayflies appear only in May. They are abundant also in early June; and in many parts of the country, groups of them may continue to emerge periodically all summer. Neither must it be implied that all Mayflies live just one day. Many do not live that long, while some may live two or three days. They can be made to live longer by preventing their mating. Great hosts of them never see the light of day, but come out of the larval stage in the evening, and mate, lay their eggs and die before sunrise.

Mayflies are found in nearly all parts of the world. They are, of course, seen in greatest numbers about bodies of water. There are about three hundred different kinds (species) of them known. They are common sights to all who live near lakes. Passing automobiles often collect hundreds of them on the windshields and headlights—their wedding day thus tragically and suddenly ended.

Their short lives are happy ones, and they go to their graves peaceful and satisfied. They do not ask for pity for the few minutes of love and happiness which they enjoy are worth the years of patience which preceded.

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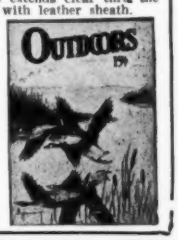

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Index to

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	PAGE
Aermotor Company	249
American Fork & Hoe Company	236
American Pad & Textile Company	242
American Telephone & Telegraph Company	2nd Cover
Atchison, Topeka & Santa Fe R. R.	237
Atlas Powder Company	239
Bartlett Manufacturing Company	252
Bausch & Lomb Optical Company	245
Beebe Brothers	244
Cavalier Hotel	246
Central Camera Company	243
Chalfonte-Haddon Hall	253
Cherry Hill Nursery Co., The	252
Chicago & Northwestern Railroad	243
Cleveland Tractor Company, The	4th Cover
Council Tool Company, The	244
Dodson, Inc., Joseph H.	253
DuPont de Nemours & Co., Inc., E. I.	234-235
Fechheimer Brothers Company, The	250
Franklin Forestry Company	252
Herbst Brothers, Inc.	240-242
Idaho School of Forestry	254
Keene Forestry Associates	252
Kelsey Nursery Service, F. W.	203
Kelsey Nursery Service, F. W.	252
Leitz, Inc., E.	250
Maine School of Forestry	241
Mears, A. H. G.	243
Model Planting Tool Company	255
National Association of Audubon Societies (Bird Lore)	248
New York State College of Forestry	254
Old Town Canoe Company	251
Outboard Motors Corporation	241
Outdoors Publishing Company	255
Pacific Marine Supply Co.	3rd Cover
Peat Import Corporation	247
Plumb, Inc., Fayette R.	245
Porter, Inc., H. K.	248
Randolph, L. F.	255
Remington Arms Company	240
Seattle Tent and Awning Co.	251
Schumacher, F. W.	255
Smith & Company, D. B.	233
Stoeger, Inc., A. F.	255
Union Fork and Hoe Company	249
Union Pacific Railroad Co.	243
Warren Axe & Tool Company	239
Western Maine Forest Nursery Co.	252
Winchester Repeating Arms Co.	238

LIGHTNING PROTECTION FOR TREES

(*Continued from page* 221)

result that there is no record of injury to any protected tree. The system is quite inexpensive and does not mar the natural beauty of the tree. It is not necessary to install a system in every tree as only the most important and outstanding trees are generally protected. The height of a tree, the location, elevation, type of soil, do not seem to influence or decrease its susceptibility. Generally speaking, the tall pointed trees on high elevations are more susceptible.

It is interesting to observe the lengths to which the average tree owner will go to preserve and restore a fine old specimen; and yet no thought is given to the fact that one stroke of lightning can ruin the tree and the work done to preserve it. Certainly, if the tree is worth preserving, it is worth protecting against lightning injury.

Winning Forestry Term Undecided

With over 600 entries submitted to The American Forestry Association in the fifty dollar prize contest to secure a term or word that will better distinguish commercial forestry from non-commercial forestry, the judges have asked for more time in which to make a decision. Before the contest closed on March 31, 1935, words and terms had been submitted from all parts of the United States and from several foreign countries.

Waltonians Support Closed Duck Season and More State Forests

The Izaak Walton League of America at its thirteenth annual convention in Chicago, April 11-13, added the weight of its voice to the public demand for a closed season on the hunting of ducks and other migratory birds in a resolution passed at the concluding session of the meeting. The League went on record not only for a closed hunting season in 1935, but for such additional closed seasons as may be deemed necessary to maintain an adequate supply of waterfowl.

Support of more state forests likewise was voted in the passage of a resolution endorsing the Fulmer bill, now pending in Congress, to authorize federal purchases of forest lands to be turned over to the states for administration under conditions prescribed by the Secretary of Agriculture. In providing lands for state forests, the government under the bill would retain title to the land until the states are able to pay purchase costs from the proceeds from the forests.

The League also gave vigorous expression of its position in respect to stream pollution in a resolution declaring public health demands that various municipalities "should be required to meet their obligation to the nation and the state by applying the first available financial aid offered by the Federal Government under the public works appropriation" to the elimination of pollution resulting from lack of municipal sewage treatment works. The resolution calls upon the President and those administering P. W. A. funds to withhold the allocation of any funds from municipalities which have no adequate sewage works until they apply for funds for such purposes. The League holds that application for sewage treatment works should be given preference over all other public works projects because of the public health involved.

Judge George W. Woods of Waterloo, Iowa, is the newly elected president of the League. He was elected by unanimous vote and succeeds Dr. Preston Bradley of Chicago.

WHO'S WHO

Among the Authors in This Issue

Aldo Leopold

ALDO LEOPOLD (*Coon Valley*), Professor of Game Management at the University of Wisconsin, is a leader in the modern school of wildlife technique. He has had wide experience in the administration of forests, game, and other outdoor resources, and in conservation research. For fourteen years prior to 1924 he was a member of the Forest Service, engaged in work on the National Forests of Arizona and New Mexico. In 1924 he became associate director of the Forest Products Laboratory at Madison, resigning in 1928 to become director of the Research Division of the Sporting Arms and Ammunition Manufacturer's Institute.

G. ALBERT HILL (*Nature's Three-Fingered Villain*), Professor of Chemistry at Wesleyan University, Middletown, Connecticut, is co-author with Dr. Louise Kelley of *Organic Chemistry*. Born in Worcester, Massachusetts, Dr. Hill received his B. S. in chemistry from Worcester Polytechnique Institute in 1913. A year later he received his M. A. from Harvard, and in 1917, his Ph.D.

CHARLES NEWTON ELLIOTT (*Forest Scholars*) is District Forester for the Georgia Forest Service with headquarters at Augusta. He is well known to readers of AMERICAN FORESTS as author of frequent articles published in the past.

Austin F. Hawes

AUSTIN F. HAWES (*Looking Forward with the C.C.C.*) has been State Forester of Connecticut since 1921. Born in Danvers, Massachusetts, he was graduated from the Yale Forest School in 1903. He is the author of numerous articles and bulletins on forestry.

T. R. GOODWIN (*Removing the "Death" from Death Valley*) is in charge of Emergency Conservation Work in Death Valley. While working in southern California, he became interested in Death Valley and often made trips there to explore different parts of the Valley and to delve into its history.

WILLIAM HARLOW (*Tree Flowers with the Miniature Camera*) is Assistant Professor in the Department of Wood Technology, New York State College of Forestry, Syracuse.

H. STEVENSON CLOPPER (*Lightning Protection for Trees*) is an arborist who lives in Baltimore, Maryland, where he has been engaged in the care of trees for the past twenty years.

NELL E. MABEY (*"White Birch"—A Mother's Day Poem*) formerly a newspaper woman, lives in Lake City, Minnesota.

ROBERT SPARKS WALKER (Poem—*The Magnolia Tree*) is an author and poet of the South, who lives in Chattanooga, Tennessee.

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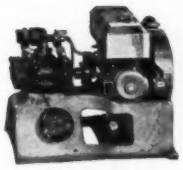

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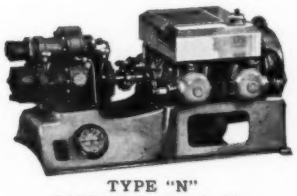

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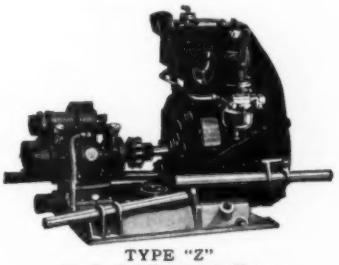

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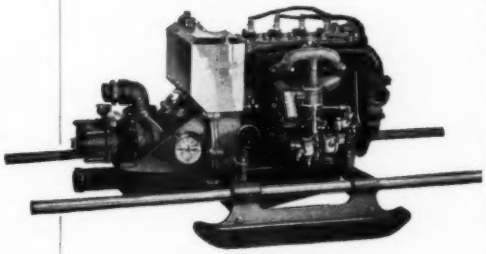

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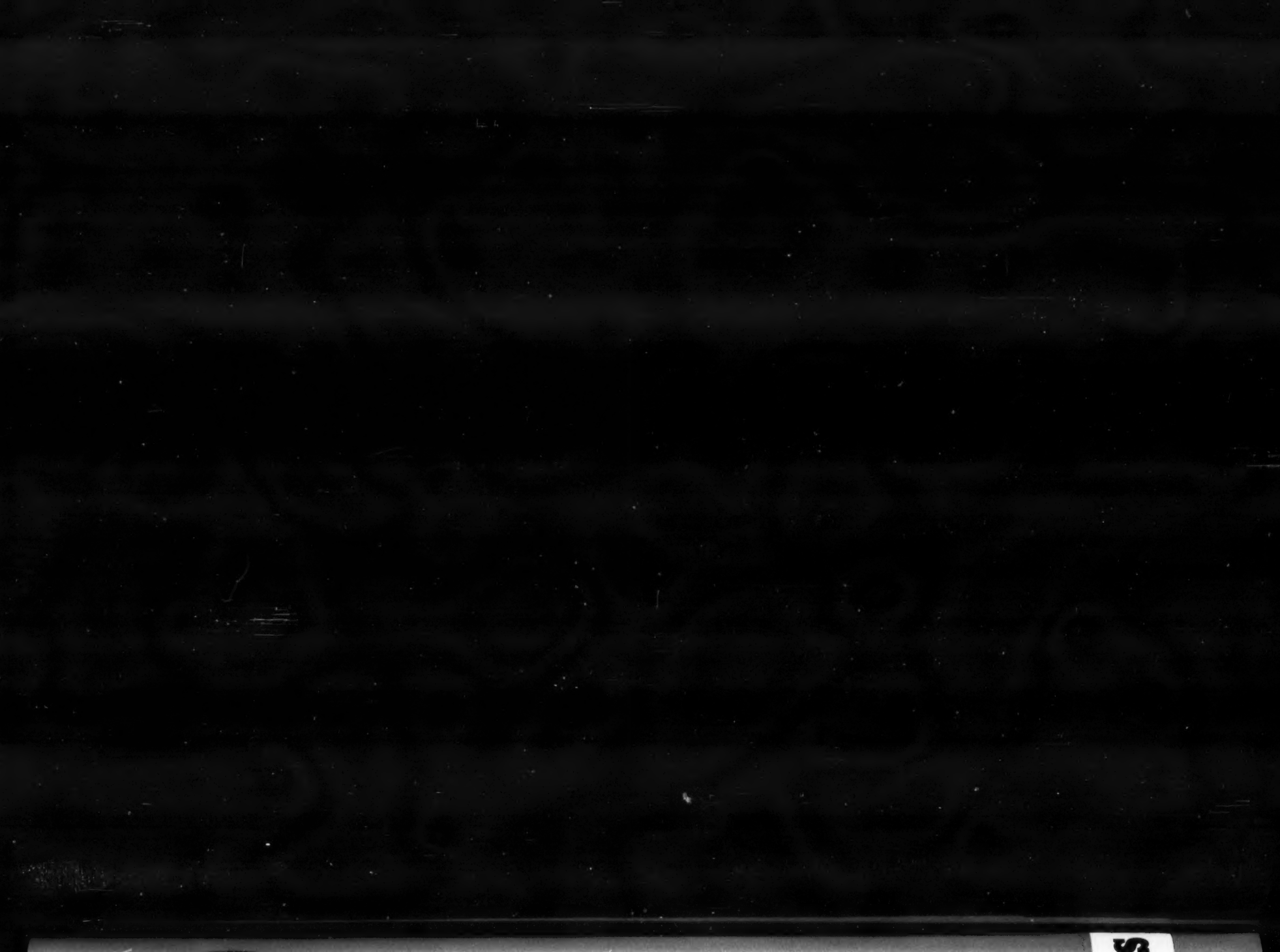
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